SEPTEMBER 18, 1937

Railway Age

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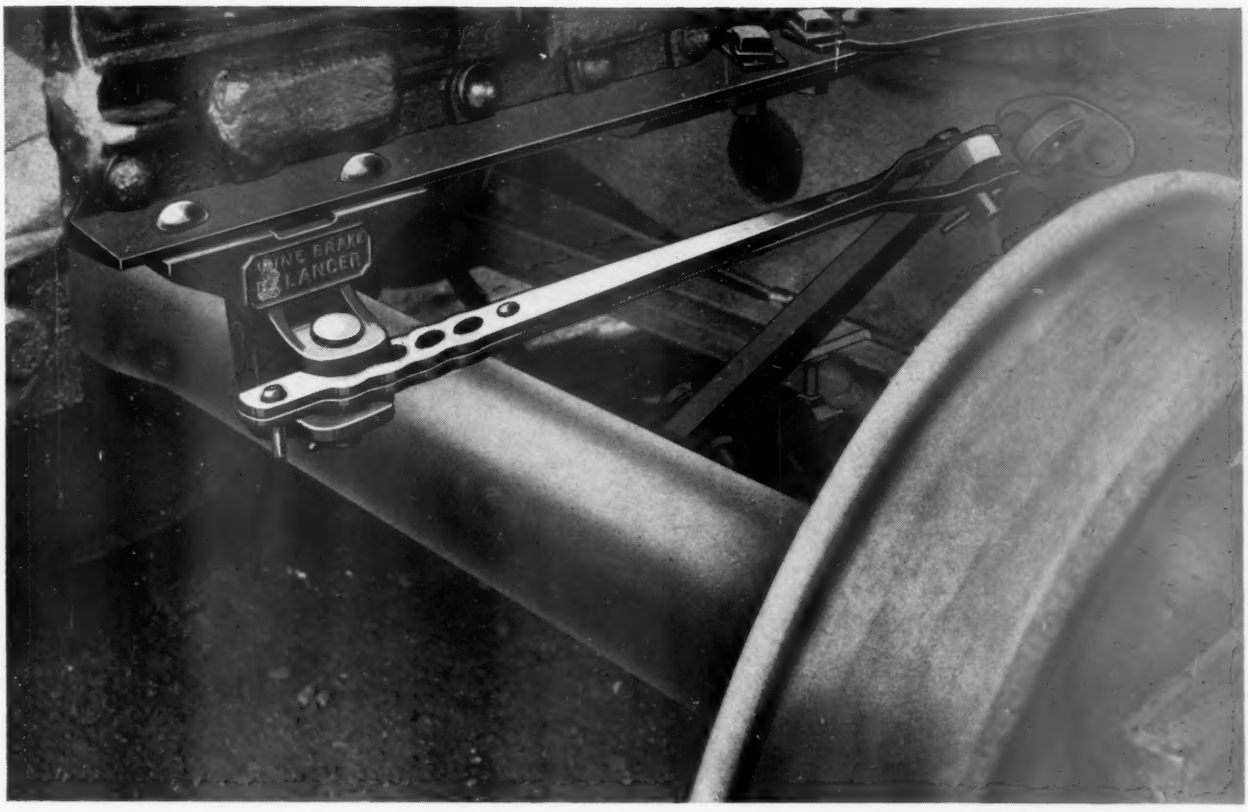

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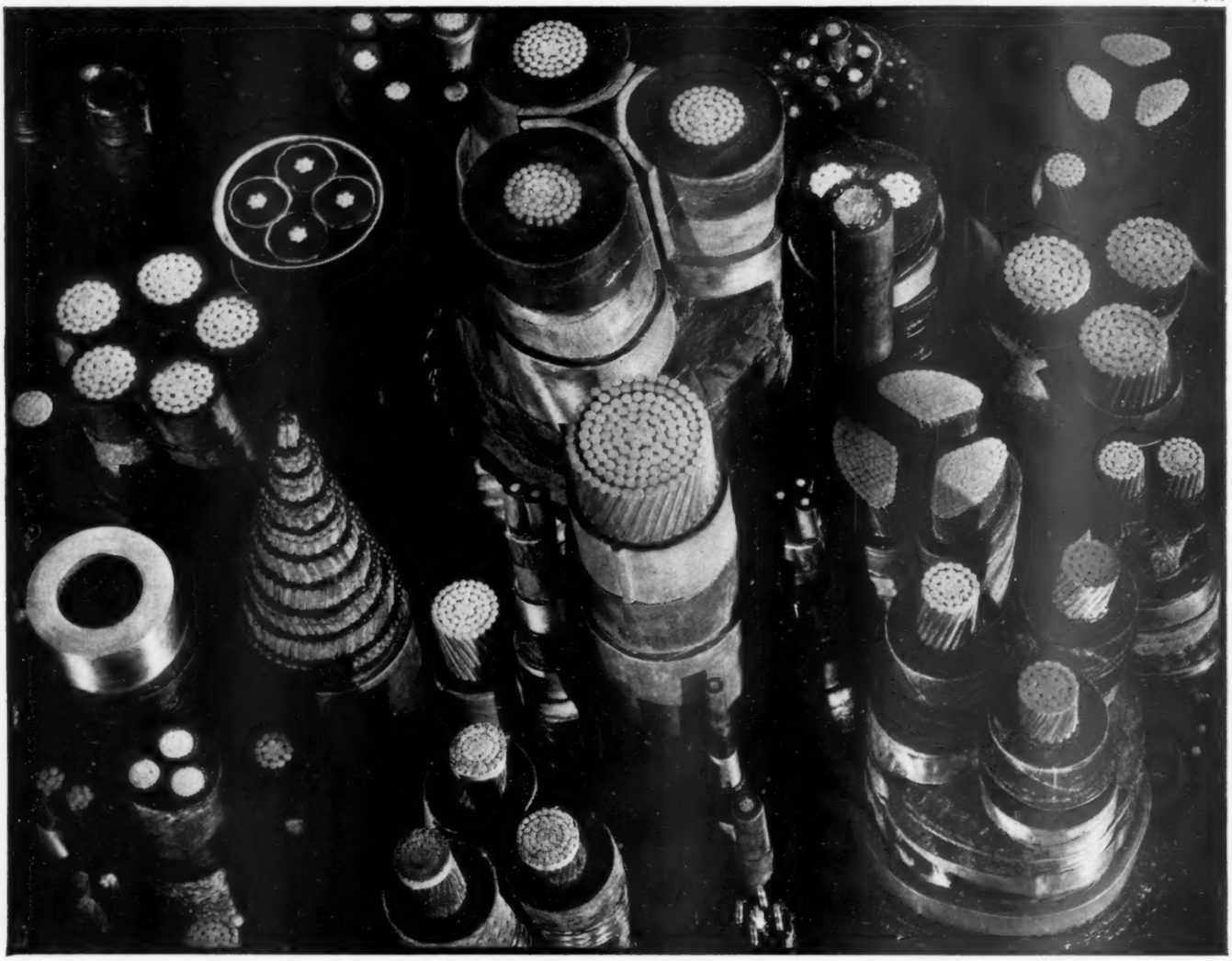

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Railway Age

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The Week at a Glance

CARLOADINGS: In the September 4 week freight cars loaded totaled 805 thousand, up 5.2 per cent from the corresponding week last year.

●

TRUCKERS CLASSIFIED: The I.C.C. has issued an order in which it sets up classifications of motor truck operators for regulatory purposes on a basis of (1) type of operation (i.e., contract, common, private); (2) type of service (regular or irregular route); (3) type of commodities transported (of which there are 17 classifications). Code symbols are applied to the various classes, details of which are given in an article herein.

●

P. R. R. LIGHT CARS: The Pennsylvania is inquiring for 19 light-weight passenger train cars—6 to be coaches, 5 to be diners and the balance for head-end traffic.

●

TRUCKERS HIT LABOR: The I.C.C. has set October 19 as the date for oral argument on Examiner Snow's proposal to set 60 hours as the maximum week for truck drivers. The employing truckmen meantime have filed a brief of exceptions to the brief the train service brotherhoods entered in this case, in which it is suggested that the train service unions desire to put truck drivers out of their jobs to create more work for railway employees. (The truck operators seem not to have heard of the train limit bill and the 20 per cent wage rise demand of these unions, probably the most effective measures yet proposed for increasing employment on trucks and decreasing it on the railroads.)

●

S. P. FOSTERS TRAVEL: In the past two or three years the Southern Pacific has hired 1,000 men to supplement its passenger crews—indicative of the increase in traffic and schedules which has occurred since it began seriously to revamp its passenger services. No one method has been employed toward this end, but rather a combination: Lower fares, greater speed, new trains, streamlining, advertising and showmanship—all these have contributed to the result. An article in this issue analyzes the devices employed, and their effectiveness.

●

TEXAS STREAMLINERS: The Southern Pacific will on September 17 place in service its two new Houston-Dallas steam streamliners, similar to its Pacific Coast "Daylights," the new trains to be called "Sunbeams." The name is borrowed from an existing train which will henceforth be called the "Hustler."

●

CAPITAL ON STRIKE: The only way to advance the incomes and the standard of living of the American people, including organized labor, is by constant investment of new capital to renew and improve our machinery of production. The only method of securing new capital is by the voluntary act of investors—and they will not put their money into an industry unless they expect to get it back, with reasonable interest. The railroad industry holds out no such prospect for investors at the present time. By attempting to attach all railway earnings in wage increases, railway labor threatens to kill off the only source of improved efficiency out of which future wage increases, if any, must come. The leading editorial herein discloses that capital is now "on strike" for a living wage; and that normal recovery and employment cannot come until its just demands are reckoned with, so that the "strike" may be called off and the normal rate of investment restored.

●

PERMANENT CONCRETE: The observations of seven leading railroad engineers on the factors which cause deterioration in concrete and how they may be circumvented, as well as the degree of "permanency" which may safely be ascribed to concrete in amortizing the investment, are set forth in an article herein.

●

PURCHASES IN QUANTITY: Many products which railroads buy are now obtainable, without penalty prices, only by buying in large quantities. This trend, which is a recent one, is discussed in an article herein by D. D. Phillips of the purchasing department of the B. & M.—listing the methods railroads may use to do their buying in quantity, thus securing minimum prices.

●

UNDER THE HIDE: Judged by the reaction of the heads of the transportation brotherhoods to the leading editorial in *Railway Age* of September 4, the actual hourly earnings of road train and engine employees is an extremely sore subject with them—and we don't much wonder at that. Ever since the days of the Adamson Act agitation they have succeeded in making the public believe that the comparatively modest basic hourly wage rates set forth in pay schedules are the wages they actually receive per hour—whereas, since most train and engine employees are paid by the mile and train speeds have greatly increased, hourly earnings are frequently double or more the basic hourly rate. The statement in which the brotherhood chiefs join together in an endeavor to put us across the barrel for our candor is published herein, together with our rejoinder.

●

PUBLICITY IS RISKY: The more the transportation brotherhoods denounce us for publishing information regarding their wages and working conditions the more they run the risk of exciting the curiosity of popular journalists. What does anyone think the public reaction would be, for instance, if it became generally known that train service employees on one large Eastern trunk line work only 12 days a month to receive a full month's wages—and scores of similar cases which could be cited from all over the country?

●

N. H. WRANGLE: Providence, R. I., interests want the I.C.C. in reorganizing the New Haven to segregate the Providence & Worcester so Rhode Island may have competitive railway service. Two groups of bondholders seek changes in the debtor's plan of reorganization—one of them, a minority represented by a well-known trial lawyer, would have it entirely upset. The suggestion is made that the New Haven drop its Old Colony affiliation and develop an alternative route between Providence and Boston. The legal and financial tournament which this proceeding has called into being will be resumed November 9, with October 11 as the last day for filing new plans and amendments.

●

MECHANICAL MEETING: The important supervisory mechanical officers' associations—fuel officers, traveling engineers, car department officers and general foremen—after six years of relative inactivity will hold simultaneous meetings in Chicago on September 28-October 1. Important decisions as to the future of these associations may be made before a great while—and this fact, coupled with the many new technical problems which have risen and need discussion and the extensive exhibits of improved appliances which will be on display, points to the urgency of attendance by a large and representative body of supervisory mechanical officers.

●

MODERNIZED CARS: The New York Central has recently completed a program of passenger car modernization, in which air conditioning, new seating, new lounge and sanitary facilities, new lighting and coupler improvements were applied to 103 cars—details being given in an article in this issue.

●

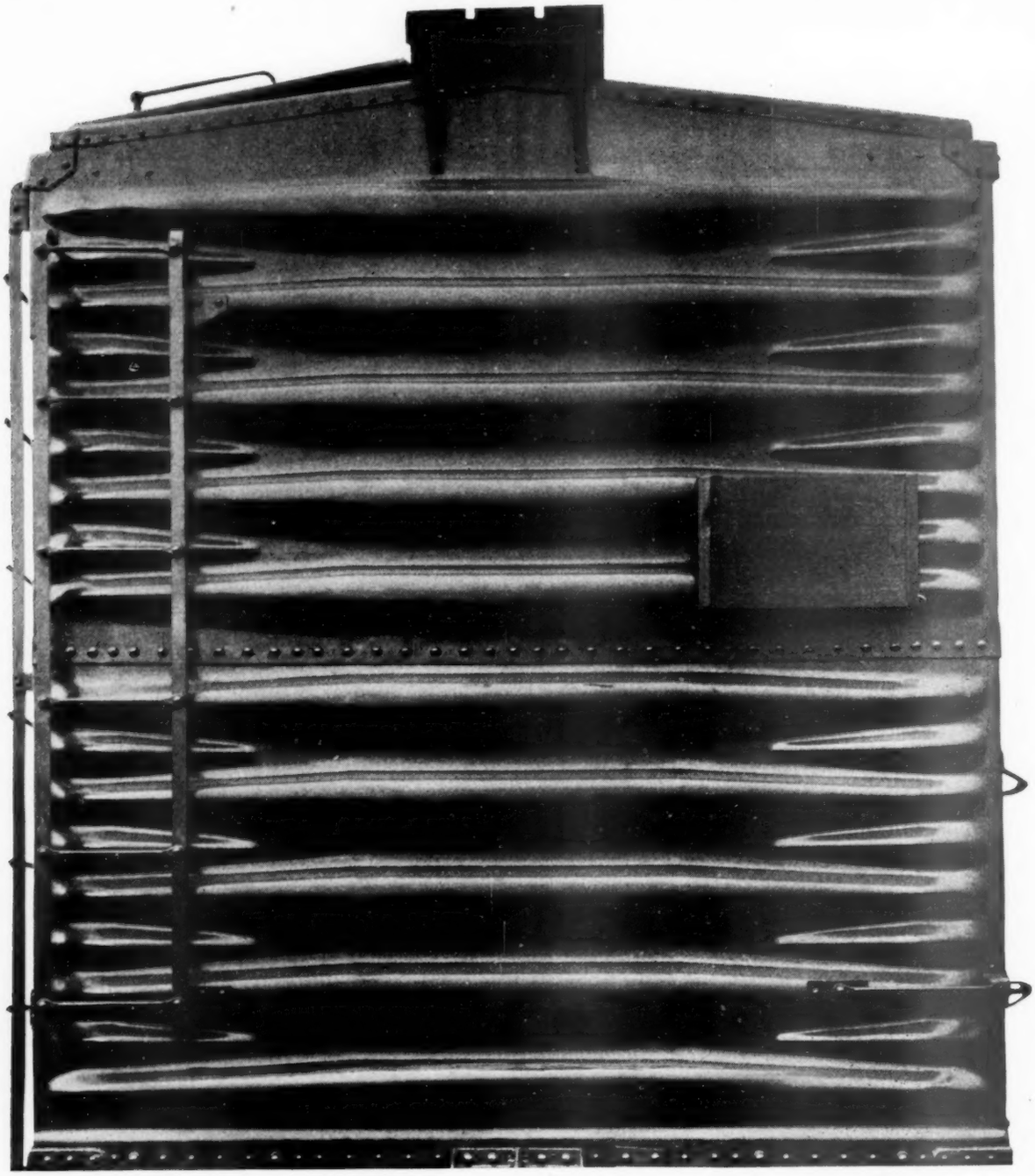
WORLD'S FAIR: The Eastern railroads this week signed a formal contract for 5½ acres of space at the New York World's Fair (to be held in 1939), agreeing at the same time to put up a $1,500,000 building. The roads have, in addition, subscribed to approximately $1,500,000 of fair bonds.

●

LINE HAUL TRUCKS: A joint board formed under the Motor Carrier Act has urged upon the I. C. C. that truckers providing station-to-station service for the railroads be required to secure certificates as common carriers.

●

MOP PLANS: Revised plans for reorganization of this company have been filed by the debtor and by the "Stedman committee," representing bondholders, which plans are a great deal more in harmony with each other than heretofore. Hearings will be held September 27.



WHEN THE DRAFT GEAR STOPS

THE DREADNAUGHT END STARTS

YIELDING UNDER EXTREME IMPACTS ONE FOOT
AS A CUSHION AGAINST THE SLIDING LOAD

RAILWAY AGE

The Wages of Labor and Capital

The *Railway Age* has emphasized in recent editorials that experience in the United States following previous depressions indicates that after four or five years of "recovery" from the present depression the total volume of business being done in this country should now be larger than prior to 1930; but that, in fact, it is smaller than in any of the prosperous years 1923-1929, inclusive, and that for more than three months it has been declining.

This view is not popular with supporters of present government economic policies, or even with many business men and newspapers that are opposed to them. Most Americans believe in the philosophy of economic optimism. They believe that business is made good or bad by what they call "confidence" or the lack of it, and that therefore anything that is said which inspires "confidence" helps business and that anything which is said that impairs "confidence" hurts business.

The *Railway Age* rejects this philosophy. It believes the only kind of confidence that helps business is that which is warranted because based on favorable economic policies and developments, and that unwarranted optimism may be as bad or worse for business than unwarranted pessimism. The only kind of confidence that helps business is a well founded confidence among business men that they will derive reasonable profits from any new investments they make; and their confidence or lack of it in new investments is determined mainly by the profits they are deriving and expect to be allowed to derive from investments already made.

Another economic theory now so widely held that it is largely determining the present volume and trend of business in the United States is that advances in wages caused prosperity. The *Railway Age* also rejects this theory. It believes that in the long run high wages are—and should be—an effect of prosperity, and that to advance wages at any time out of proportion to the ability of a single industry or of industry as a whole to pay them at that time tends to prevent prosperity by preventing the well-founded confidence in future profits necessary to cause new investment.

Wages of Railway Capital and Labor

What these economic beliefs of the *Railway Age* mean, in summary, is that it is as essential to prosperity that the capital invested in a particular industry or in industry as a whole shall be paid reasonable wages as that the labor it employs shall be paid reasonable wages; and that any policies of government or business or both which prevent capital from being paid a reasonable wage will as certainly prevent prosperity as any policies that prevent labor from getting a reasonable wage.

These economic beliefs, have an obvious bearing upon the railway situation at the present time. It was held by the Interstate Commerce Commission fifteen years ago that in the public interest the railways should be allowed to earn annually on the average a return of 5¾ cents upon each dollar invested in their properties. In the seven years ending with 1929 they earned an average of 4.59 per cent. During the seven years ending with 1936 they earned an average of only 2.1 per cent; and in the first seven months of 1937, after four years of so-called "recovery" they earned at an annual rate of 2.73 per cent. The wage of railway capital during the depression has been less than one-half as high as during the preceding years of prosperity, and even thus far this year has been not much more than half as high. During the depression years the wages paid the labor employed by the railways were reduced even as much as 10 per cent for only a short time, and more than two years ago were restored to the pre-depression level. Recently an advance of about 8 per cent was granted to most railway employees. At present the brotherhoods of train service employees are pressing a demand for an advance of 20 per cent.

In other words, at a time when the average wage of railway capital is still much lower than before the depression, railway labor is seeking, and in some measure has secured, a higher average wage than it ever received before the depression, with a resulting tendency to postpone indefinitely the time when railway capital will be able to get a pre-depression wage.

Necessity for Investment of Capital

The wage of all capital declined during the depression and in only a few industries has been restored to a pre-depression level. It is worth while to review the past effects of changes in the wage of capital for the light that may be thrown on the probable future effects of restricting or even abolishing it.

It is a fact that should be obvious, but is too often overlooked, that if there had been no capital invested in railroads and industry, there would be no railroads and industry to provide jobs and pay wages. Scarcely

less obvious, and just as important, is the fact that capital goods are not permanent; they wear out or become obsolete and have to be renewed. Not only, therefore, to improve the efficiency of the railroads and industry—and hence increase the national standard of living—but even to prevent the present standard of living from deteriorating rapidly, there must be constant reinvestment and new investment in industrial and railroad plant. Under our present economic system, there is no way that funds needed to maintain and improve railroad and industrial plant can be obtained except by voluntary act of the investors who own the capital, or by the managements who may be empowered to invest earnings of an industry in plant improvements. Unless investors believe that their investments will be reasonably safe and will earn for them some interest or dividends; or unless an industry has surplus earnings sufficient to supply its needs for new capital—then plant facilities are bound gradually to deteriorate and become obsolete.

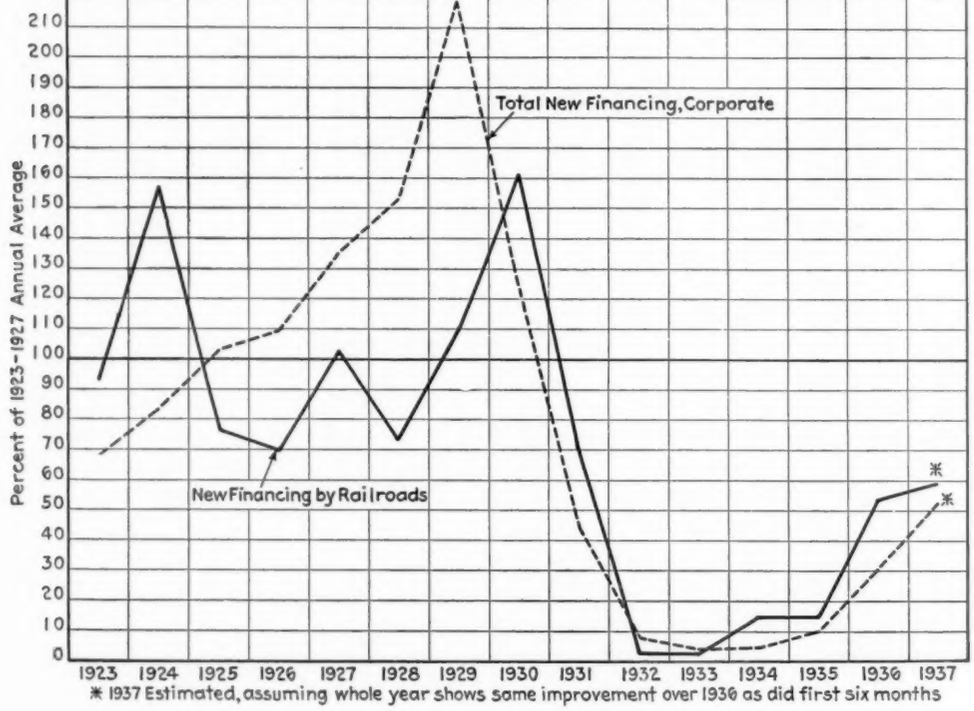
Starving Out Capital

Just so far as an industry so deteriorates, its ability to provide jobs and wages also declines. Nothing that labor unions or labor-minded politicians can do can circumvent this eventuality, if the investors are starved out. It is customary to look upon "capital" as something impersonal—but back of the stocks and bonds are human beings who are just as real as wage-earners and who need shelter and clothing and three meals a day. Indeed, to a very large degree, the "capitalists" are the wage earners themselves in their capacity as insurance policyholders and savings bank depositors. *Let the wage-earner who thinks that it is unnecessary to pay any regard to the claims of capital, ask himself whether he would voluntarily put his money into a bank or insurance company which would pay him no interest and could not even be sure of returning his principal intact.* He would not entrust his savings to such an institution; and managers of such institutions, being cognizant of that fact, will not invest his money in industries where capital is being starved out.

These facts are elementary and cannot be questioned, but they are being flagrantly disregarded nevertheless by organized labor, and by politicians who profess a regard for "human rights over property rights". Without an abundance of capital goods we cannot have a decent standard of living—for labor or anybody else. And capital goods require "capitalists", i. e., persons who are willing to forego the immediate expenditure of a portion of their income and, instead, invest it where it will provide more jobs and greater production—out of which increased production they expect to be paid something for the sacrifice of immediate spending which they made when they saved the money. If they believe they will not be paid for this sacrifice, they will not save and they will not invest. And the capital plant of the industry which cannot give reasonable assurance to prospective investors that their investments will be safe and remunerative will inevitably deteriorate; and when that occurs, out go the opportunities for plenteous jobs and good wages in that industry.

Business Poor Because Capital is "Striking"

Labor is not the only partner in industry which can, and does, strike. So can, and do, both capital and customers. It would be well at this time when "labor" is in the saddle and riding high to give some attention also to the other partners in industry—customers and capital. As a matter of fact, the "strike" of capital



Course of New Investments for Expansion and Improvement of Railroad and Industrial Plants During Past 15 Years

which is now going on is a much more serious matter for the future prosperity of this country, including that of organized labor, than any of the labor strikes which have recently occupied so much space in the newspapers. It is the principal cause of the continuance of poor business and of the recent decline in general business.

The nature and extent of the "strike" of capital is disclosed in part in the accompanying table, which sets forth, in round numbers, the compilation of the Commercial and Financial Chronicle of new investment and reinvestment in railroads and total corporate enterprise

Railroad and Total Corporate Financing in the Past 15 Years

(in Millions of Dollars)

	Railroad New Capital	Railroad Refunding	Total Railroad Securities	Corporate New Capital	Corporate Refunding	Total Corporate Securities
1923	464	54	518	2,702	530	3,232
1924	779	161	940	3,322	516	3,838
1925	380	134	514	4,101	637	4,738
1926	346	76	422	4,357	942	5,299
1927	505	457	962	5,373	1,928	7,301
1928	364	363	727	6,079	1,738	7,817
1929	546	271	817	8,639	1,387	10,026
1930	797	229	1,026	4,944	529	5,473
1931	346	170	516	1,763	825	2,588
1932	13	48	61	325	318	643
1933	12	88	100	160	221	381
1934	73	176	249	178	313	491
1935	73	124	197	403	1,864	2,267
1936	267	529	796	1,217	3,415	4,632

in this country during the past 15 years. It will be noted, to be sure, that there was a sharp upturn in investment last year, which continued during the first half of this year. Nevertheless, *new* investment (as contrasted with refinancing) was virtually at a standstill for four years, indicating a deficiency which must be made up if the rate of improvement in the standard of living of the American people is to regain its pre-depression level. And the increase of new investment since 1935 has been relatively small and entirely inadequate. The new investment in the railroads in 1936 was only half as great as in the pre-depression years and in industry as a whole only one-fourth or one-fifth as great.

We do not, of course, maintain that the "strike" of capital in the early part of the depression was primarily the fault of the labor unions or the politicians, although the latter had a great deal to do with it. But certainly it is militant unionism and its political cohorts which now constitute the main threat to a living wage for capital, and who thus discourage industrial managements from seeking investment funds and make investors chary of offering them. And yet the labor executives—though perhaps not their political henchmen—are intelligent men, who must know that in increased capital investment lies the only road to improved industrial efficiency and higher real wages.

The Deficiency in New Financing

The deficiency in new financing by railroads and all corporate enterprise is shown graphically in the accompanying chart. Neither it nor the table, however, tell the whole story of the obstacles which have been placed in the path of a rising standard of living for the American people by persons presumably so much interested in "human rights". Neither the table nor the chart reveals the uncapitalized investment of corporate earnings in capital improvements upon which the politicians have levied penalty taxation as high as 27 per cent. From 1923 to 1936 the investment in railroad property increased by 3½ billion dollars, while outstanding stocks and bonds increased by only half a billion—the difference indicating the extent to which the railroads improved their plant (and hence their ability to give better service and pay high wages) by "ploughing back" earnings into their properties. Such investment may not always have been in the interest of stockholders—but no one can doubt its benefits to railway patrons and to railway employees. And yet it is precisely the type of politician who is supposed to cherish labor who is responsible for this penalty tax.

The labor executives have criticized the railroads for the extent of their bonded indebtedness; yet the tax on "undistributed" earnings penalizes any attempt by the carriers to discharge such indebtedness. This tax is, moreover, an open invitation to overcapitalization, since, to escape penalty taxation, a corporation must issue securities for every dollar it invests, even when such investments turn out to be ill-advised and even worthless.

Responsibility of Labor Leaders

The leaders of labor in America today enjoy more power than ever before in history—more power, perhaps, than any group of persons has ever wielded in the republic. This power they may exercise in either of two ways—one, actually to increase the national income and the living standards of their members and the American people as a whole; or, they may exercise their power so as to give the appearance of bettering the condition of their membership, regardless of the effect it may have on the rest of the population and even on their membership. To a large extent, it is the latter course which so far they have followed. Being intelligent men for the most part, however, they must see that there is a limit beyond which mere concern for reducing the contribution to production of their members, while increasing their exactions in wages, cannot go without destroying the wage and job providing power of industry.

John L. Lewis recently called attention to the support given by the United Mine Workers to the Guffey Act, which is designed to assure a fair profit to the coal industry. One looks in vain, so far, for similar concern for a reasonable return to capital for the railroad industry on the part of the railway labor executives. Yet the future standard of wages and the volume of employment in the railroad industry are directly related to the amount of new capital which is going

into the business. The wage increase or the "make work" legislation which curtails the willingness of railway managements to spend money for additions and improvements, or the willingness of investors to advance funds for such purposes, is equivalent to living on capital. Wage concessions of such character "get by" today only because they exist at the expense of future wage payments and future volume of employment, which must cease when present plant wears out because replacement capital has not been provided.

Mechanical Meetings Deserve Support

A series of four simultaneous mechanical association meetings, scheduled to be held at the Hotel Sherman, Chicago, September 28 to October 1, inclusive, deserves the interest and hearty support of higher railway officers. The various groups involved include the Railway Fuel and Traveling Engineers' Association, Car Department Officers' Association, International Railway General Foremen's Association and Master Boiler Makers' Association. These associations all have a potentially important part to play in the efficient maintenance and operation of railway equipment and it is pleasing to note that they are beginning to function again on a sound and efficient basis after a period of six years of more or less limited inactivity.

A feature of the meetings this year will be an extensive exhibit by the Allied Railway Supply Association, and railway men who attend the convention will thus be able to supplement information gained at technical sessions by personal inspection of almost every type of new and improved mechanical equipment and supplies. About 100 companies have already contracted for exhibit space, aggregating roughly 14,000 sq. ft. of floor area. After an interval of six years since the last exhibit, it is not exaggeration to say that the present display will exceed, both in variety of products shown and improvements demonstrated, any previous exhibit of railway equipment and supplies held in connection with the Fall mechanical conventions at Chicago.

With the growing sentiment on the part of many responsible men in both the railway and railway supply field that too many associations have been permitted to develop in the railway mechanical field, *Railway Age* is not in entire agreement. True, there has been some overlapping in membership and in subject matter, a condition already remedied by one important consolidation, namely, that of the International Railway Fuel Association and the Traveling Engineers' Association. The proposal to include the Air Brake Association with this group has some merits, but also some rather weighty disadvantages. The same may be said about the proposal to consolidate the blacksmith, tool and boiler foremen with the International Railway General Foremen's Association and painter foremen with the Car Department Officers' Association. Each of these highly-specialized groups has peculiar individual problems and, in fact, speaks a language all its own. The result of unnatural consolidations in any of these groups is bound to be a "confusion of tongues" unless the meetings are confined largely to innocuous generalities.

Certain group consolidations and realinements, however, can be made in the best interests of the railroads and individual association members and it is hoped that these will be consummated as a result of appropriate action taken at a joint committee meeting during the coming convention. It is important, therefore, that the opportunity of attending the convention be extended to as many mechanical department supervisors as practicable, including not only fuel supervisors, traveling engineers, general foremen and boiler foremen but other departmental supervisors including painter foremen, who will probably be taken under the wing of the Car Department Officers' Association for the time being at least.

"Retard Progress" Program

Notice to every man, woman and child in the United States! The Senate has passed a bill to limit the length of trains.

It should be called a bill to make railroads run unnecessary trains. It would increase the death and accident hazard at railroad grade crossings. It would create wasteful employment for which the consuming and traveling public would have to pay in increased prices. It would reduce efficiency and create tremendous waste by making unnecessary, modern locomotives developed to handle American railroad traffic rapidly and efficiently.

An attempt was made to force this piece of "retard progress" legislation through the House without committee hearings or real consideration. The effort failed and the whole matter went over for deliberation in January.

Consider the logic, or rather lack of logic, in this type of cost-raising legislation. Take a grocery store, a meat market or a newspaper which has installed modern motor equipment to deliver its goods to the public at a minimum of expense and with the least delay. Would it be logical to force them to use two trucks instead of one to make the same deliveries, for the primary reason of employing more truck drivers? Who would pay for such a wasteful procedure? The housewife and consumer of course.

You can't add to the cost of doing business without adding to prices paid by consumers, unless you want the business to go broke or have the government operate it, and pay the deficit from tax funds collected from all the people.

Forcing railroads to run two short trains instead of one long train, is no whit different in effect, from the standpoint of waste, than would be similar legislation to force every employer now running one large truck to replace it with two smaller trucks. In fact, the latter law would be more effective in creating employment.

—*From the New Sterling (Ky.) Gazette.*

The "City of San Francisco" Crossing Great Salt Lake

How the Southern Pacific Is Modernizing Its Passenger Service

Improved equipment, faster schedules and better salesmanship are successful in meeting competition and are bringing a large increase in traffic

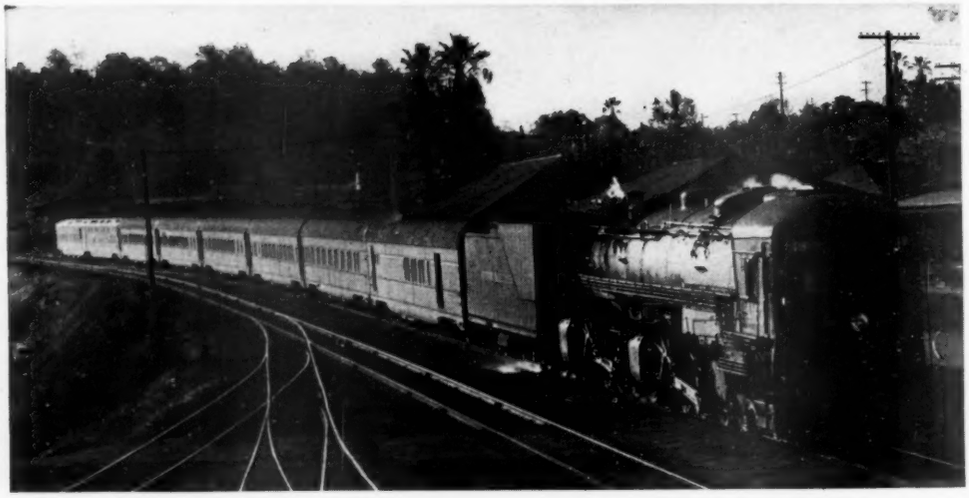
IN THE last two or three years, the Southern Pacific has hired nearly a thousand men to supplement its passenger train crews. This is indicative of the success of its campaign to modernize its passenger service to supply the type of transportation the traveler wants and at the price he wishes to pay. It is particularly encouraging, since it has brought about a distinct reversal of the downward trend in passenger travel by rail that existed long before the depression and was merely accelerated during the lean years.

No one thing is responsible for this upturn in passenger traffic on the Southern Pacific. It is the result of a combination of advertising, salesmanship, fast and frequent service and low rates; all of these factors playing major roles in the revival. Moreover, while the operation of the new Daylights between Los Angeles and San Francisco, and the City of San Francisco between Ogden and San Francisco, on extremely fast schedules are the most spectacular of the recent developments, they are only two of the many things the Southern Pacific is doing to regain passenger traffic.

Speed has been considered of paramount importance in meeting competition, and, as shown by the accompanying table, shorter schedules have not been confined to the streamliners. It will be observed that, almost without exception, all of the through trains on the various routes operated by the Southern Pacific are making much faster time; also, that a number of new fast trains have been added to provide more frequent service.

This improvement has not been confined solely to through trains. Adjustments have also been made from time to time in local passenger train operation to conform to the necessities of the local communities, including reductions in running time between principal cities where the volume of passenger travel justifies the operation of passenger trains with a limited number of intermediate station stops. As an illustration, the running times of two trains from San Francisco to Sacramento have been reduced from 2 hr. 40 min. and 2 hr. 45 min. to 2 hr. 15 min. and 2 hr. 20 min., respectively, and the running times of two trains from Sacramento to San Francisco have been reduced from 2 hr. 40 min. each to 2 hr. 17 min. and 2 hr. 22 min., respectively.

The City of San Francisco, operated between San



The New "Forty-Niner" Passing Newcastle, California

Francisco and Chicago in connection with the Union Pacific and the Chicago & North Western, was the first of the high-speed streamliners to be operated over the Southern Pacific on regular schedules. It has been carrying capacity loads five round-trips a month for more than a year. This train is operated over the Southern Pacific between Ogden, Utah, and Oakland

Comparison of Passenger Train Schedules 1932-1937

Train	Between	1932 Hr.	1932 Min.	1937 Hr.	1937 Min.
OVERLAND ROUTE					
Streamliner "City of San Francisco" (Inaugurated June 14, 1936)	San Francisco-Chicago	Not		39	50
	Chicago-San Francisco	operated		39	37
Pacific Limited	San Francisco-Chicago	66	00	58	15
	Chicago-San Francisco	67	50	61	02
San Francisco Overland Limited	San Francisco-Chicago	60	55	58	15
	Chicago-San Francisco	60	55	60	12
Mail and express	San Francisco-Ogden	24	05	22	00
Fast mail	Chicago-San Francisco	59	30	59	12
GOLDEN STATE AND SUNSET ROUTES					
Sunset Limited	Los Angeles-New Orleans..	56	10	54	00
	New Orleans-Los Angeles..	57	05	54	15
Argonaut	Los Angeles-New Orleans..	60	20	57	30
	New Orleans-Los Angeles..	60	00	58	10
Apache	Los Angeles-Chicago	65	40	58	40
	Chicago-Los Angeles	64	55	61	10
Golden State Limited	Los Angeles-Chicago	61	15	58	45
	Chicago-Los Angeles	61	00	60	15
Californian (Inaugurated January 3, 1937)	Los Angeles-Chicago	Not		58	35
	Chicago-Los Angeles	operated		60	55
SHASTA ROUTE					
West Coast	Los Angeles-Portland	37	55	35	55
	Portland-Los Angeles	37	35	34	35
Shasta	San Francisco-Portland ...	26	15	25	25
	Portland-San Francisco ...	26	05	25	52
Klamath	San Francisco-Portland ...	24	35	23	30
	Portland-San Francisco ...	24	50	23	32
Cascade	San Francisco-Portland ...	21	00	19	40
	Portland-San Francisco ...	21	00	19	52
Oregonian	San Francisco-Portland ...	Not		21	00
	Portland-San Francisco ...	operated		21	02
COAST ROUTE					
Daylight	San Francisco-Los Angeles.	12	30	9	45
	Los Angeles-San Francisco.	12	30	9	45
Sunset Limited	San Francisco-Los Angeles.	13	30	12	10
	Los Angeles-San Francisco.	13	40	12	10
Lark	San Francisco-Los Angeles.	13	15	12	00
	Los Angeles-San Francisco.	13	15	12	00
Coaster	San Francisco-Los Angeles.	14	25	13	45
	Los Angeles-San Francisco.	14	40	13	45
SAN JOAQUIN VALLEY ROUTE					
San Joaquin	San Francisco-Los Angeles.	14	25	14	10
	Los Angeles-San Francisco.	14	05	13	42
West Coast	Sacramento-Los Angeles ..	14	45	13	20
	Los Angeles-Sacramento ...	14	45	13	15
Owl	San Francisco-Los Angeles.	14	45	14	25
	Los Angeles-San Francisco.	14	30	14	12

Pier, 781 miles, on a schedule of 15 hr. 17 min. eastbound and 13 hr. 52 min. westbound, the difference in time being accounted for by the variation in grade and curvature, resulting in allotment of a greater percentage of through time to the eastward trip. This compares with the fastest schedule operated in 1932 between Ogden and Oakland Pier of 21 hr. 40 min. Between San Francisco and Chicago, the schedule of this train is 39 hr. 50 min. eastbound, and 39 hr. 37 min. westbound, as compared with the fastest schedule of 59 hr. 30 min. in 1932. A brand new streamliner City of San Francisco is now under construction. It will be 17 cars long, twice as powerful as the present streamliner, and will carry many more passengers. Its accommodations will include 60 rooms. The new train will replace the present streamliner.

On July 8, another fast semi-streamlined train, known as "The Forty-Niner," was added on this route, making five round trips a month on a 49-hr. schedule eastbound, slightly longer westbound, between Chicago and San Francisco. The departures of the new train are coordinated with those of the City of San Francisco, so that de-luxe, high-speed service is available every third day from both Chicago and San Francisco. This train is powered by high-speed steam locomotives, and the last of its eight cars is one of Pullman's "two-car units," including the new duplex bedroom car.

The New Daylights

The two new "Daylights," which began operation this spring between Los Angeles and San Francisco on the Coast route of the Southern Pacific, were described in detail as to equipment in the *Railway Age* of March 13, 1937, page 418. These trains were among the first of the deluxe day-coach trains when they were established a number of years ago. As early as 1928, they were put on what was then considered a fast schedule and they featured low cost buffet meals, modern equipment and a lounge-observation car in which a small extra charge was made for reserved seats.

The new light-weight equipment, however, pulled by new, powerful, streamlined steam locomotives, makes possible a much faster schedule than before. In 1932, for example, these trains were scheduled at 12 hr. 30 min. between Los Angeles and San Francisco, 471 miles, as compared with the present schedule of 9 hr. 45 min., a saving of 2 hr. 45 min. The type of service supplied on these trains is indicated by the fact that each of them has a crew of 45, including the enginemen, trainmen, train passenger agent, maid, porters, news agent, and the crews of the diner, the coffee shop and the tavern car.

Careful preparation was, of course, essential before the high-speed runs referred to above could be inaugurated. Much money had to be spent on the track in

lengthening the spirals of curves and other improvements, particularly in the mountain territory. On the Daylight route, for example, this involved the replacing of nearly 80 track-miles of 90 and 110-lb. rail with 112 and 131-lb. sections. Many curves were relined, particularly between Metz and Santa Margarita and between Montalvo and Chatsworth. Crushed rock ballast was installed on 32 miles of track and existing crushed rock ballast was reinforced on nearly 70 miles. Sidings were lengthened at several stations, involving about nine miles of new track. More than 300 special-type speed boards were erected at various points, these boards being intended only for the Daylights. They are round and painted yellow, in contrast to the white, oval-type which give the speed limits for regular trains. The control circuits at certain highway crossings were also extended, to give motorists ample warning of the approach of the high-speed trains.

Of particular interest from an operating standpoint, however, are the preparatory test runs that were made before the fast schedules were put into effect. These test runs have been made over more than 2,000 miles of the Southern Pacific main line, along which every milepost was charted on a special sheet, with spaces opposite for pertinent operating information. On each of the test runs, the elapsed time between each milepost and the average speed in miles per hour for each mile was listed. Other information included the scheduled arrival time at every agency and non-agency station, yard limit, tower, double track, junction and railroad crossing, as compared with the actual arriving time.

These performance record sheets serve a two-fold purpose. The engineering department had previously set up a theoretical chart to indicate the speeds at which the trains could be operated, predicated on the physical characteristics of the equipment, track, roadbed, structures and other influencing factors. The performance records supply a comparison of actual with theoretical operation, from which a chart of practical operations was developed.

Similarly, the superintendent of transportation had set up a theoretical schedule after conferences with the passenger and engineering officers and the superintendents over whose divisions the new trains operate. Here, too, a comparison of the actual runs, as shown on the performance sheets, was made with the theoretical line-up, and proved invaluable in making the necessary adjustments to produce an effective timetable schedule.

The first air-conditioned equipment that was placed in regular service on the Southern Pacific (Pacific lines) consisted of dining cars in the Overland Limited, Golden State Limited and Sunset Limited. In 1934, air-conditioned lounge cars and room sleepers were placed in service in the Overland Limited, Golden State Limited, Sunset Limited and Cascade; air-conditioned diners in the Cascade; and air-conditioned reserved-seat cars in the San Joaquin. In 1935, air-conditioned reserved seat cars, diners and coaches were placed in service in the Daylight, also air-conditioned coaches, sleepers, lounge cars and diners in other trains.

Southern Pacific (Pacific Lines) Air-Conditioned Cars After Completion of 1937 Program and Receipt of Cars Ordered for Delivery In 1937

	Number and Year AC						
	1932	1933	1934	1935	1936	1937	Total
Combination Baggage-Chair						2	2
Chair Cars and Coaches				43	58	82	183
Reserved Seat				2		1	3
Assembly						2	2
Cafe-Coach					1		1
All Day Lunch						3	3
Tavern						2	2
Club				1		3	4
Lounge			9	3	13	14	39
Lounge-Observation			4			2	6
Diner	14		5	17	14	20	70
Cafe-Lounge				4	4	5	13
TOTAL	14	0	18	70	90	136	328

Equipment air-conditioned in 1937 includes 29 cars purchased for 1937 delivery:

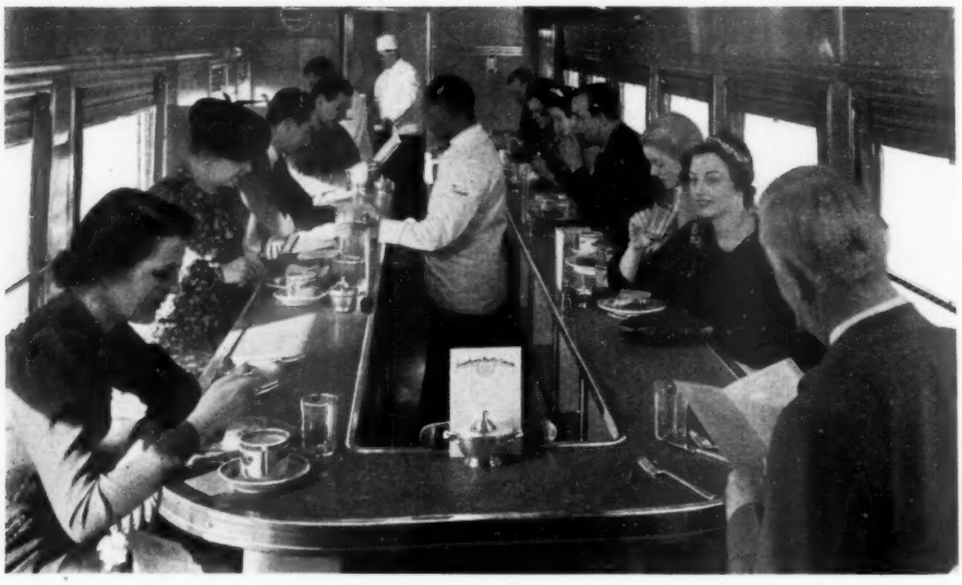
24 for Daylight
15 for Californian
10 for San Francisco Challenger

Since 1935, the air-conditioning program has been expanded, and after completion of the 1937 air-conditioning program and with receipt of new equipment purchased for 1937 delivery, the Southern Pacific (Pacific lines) will own a total of 328 air-conditioned cars and will have all through, and some local, trains completely air-conditioned. The 328 air-conditioned cars owned consist of 49 new cars purchased in 1937, the remaining 279 cars that were modernized and air-conditioned in Southern Pacific shops in Sacramento, with the exception of 14 diners that were air-conditioned by the Pullman Company at Chicago in 1932.

New Services

In connection with the Chicago, Rock Island & Pacific, the "Californian" was established between Chicago and Los Angeles on January 3, 1937. This train is made up of the latest type air-conditioned reclining chair coaches and tourist sleepers, with a special car for women and children. Low-priced dining car meals are supplied, together with a 5 and 10 cent "off-the-tray" service. Its

The Billboard Campaign Has Been Surprisingly Effective, Particularly on Days Like This



A Snack Car Is One of the Features of the New "Daylight"

running time approximates the schedule of the all-Pullman Golden State Limited. Early in March, stewardess service was made an added feature of this train, and 10 registered nurses were employed to look after women, children and infirm passengers. New lounge cars for tourist car passengers have just been added to the train. Later this year, a similar train, to be called the "San Francisco Challenger," will be placed in service between Chicago and San Francisco in connection with the Chicago & North Western and Union Pacific, operating over the Southern Pacific between Ogden and Oakland Pier.

One of the Ads That Attracted Much Attention

An interesting sidelight of the new Southern Pacific service is the provision of free pillows for coach passengers on all through trains. This involved the manufacture of 7,000 pillows, containing 14,000 lb. of feathers; also 32,200 pillow slips, 6,500 covers and 380 large pillow pouches.

Sales and Advertising

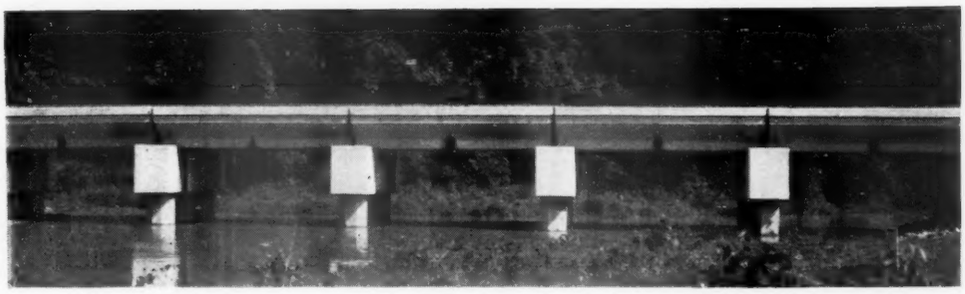
The Southern Pacific has been particularly active in training not only its passenger agents, ticket clerks and others in salesmanship, but also the large staff of information clerks who handle telephone inquiries. Periodic meetings of the passenger staff are held in what are known as "Streamline Sales Institutes" at various key cities on the system. Lectures are given in all phases of the passenger field by experts, the subjects of these lectures in San Francisco, for example, having been as follows at recent meetings:

Historical Background of the Southern Pacific
Southern Pacific Organization
Train Service
Tariffs and Fares
Tickets
Accounting
Commissary
Baggage
Telephone and Telegraph
Salesmanship

Special meetings are also held upon occasion. Before the Daylights began operation, a meeting of 150 passenger representatives was held in Los Angeles, where all features of the trains and their service were explained and the trains themselves were inspected.

A vigorous and effective advertising campaign has also played its part in the revival of passenger traffic. "Sandy," a Scotch character invented by the Southern Pacific advertising department, is well known on the Pacific Coast, particularly as a result of the ad "You Take the Highroad, I'll Take the Railroad," which is reproduced in an accompanying illustration.

All the usual and general means of advertising are employed, as well as an effective billposter campaign. This has involved the placing of eighty highway bulletins along automobile routes, reading "Next Time Try the Train." This was particularly effective last winter when heavy snows in the California and Oregon highlands made driving a hazardous and uncertain business.



The Reinforced Concrete Trestle Is Distinctly a Railroad Development

How Permanent Is Concrete?

Seven railway engineers express their views on cement as a factor in the failure or deterioration of structures

IN a monograph, abstracted in the *Railway Age* of July 17, under the heading "How Permanent Is Concrete?", Professor David L. Snader discussed failures and the deterioration of concrete structures and offered the conclusion (among others) that the action of "contact water" in dissolving some of the compounds formed by the hydration of the cement is the most important element leading to the deterioration of concrete. Because the railroads have long been among the leading builders of concrete structures and have contributed largely to the advance in concrete construction practice, a number of railway engineers were invited to express their views on Professor Snader's paper. Seven responses were received and they are presented in this and following pages.

"Permanent" Is a Relative Term

By J. F. Leonard*

Professor Snader says—"Some 10 or 15 years ago the engineering profession began to question the permanence of certain types of concrete structures under the general conditions of use then existing, particularly of structures exposed to weathering or to the action of water." This is well founded. I do not think there is a person who has given this matter serious thought but who has been forced to the conclusion that concrete, being a porous material, is subject to surface deterioration from weathering. Moisture is absorbed and a constant cycle of freezing and thawing breaks down the surface. The conclusion is therefore that all concrete exposed to weather conditions, and especially at any point above the tropics where freezing does occur at one time or another, demands surface sealing of these pores.

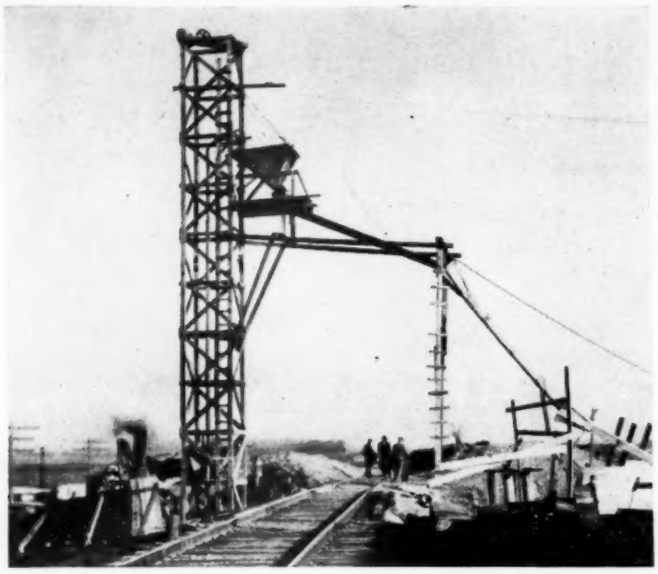
On this basis of reasoning, the matter becomes a practical one of obtaining a proper material for this purpose, and of the cost of providing such a surface sealing as against the anticipated cost of repairs due to surface failure. This would eliminate the question of the capitalized value for appearance, and which naturally should have first consideration in many places.

Professor Snader in his conclusions goes a very considerable step farther in regard to the cause of deterioration, contending that moisture absorption in the matrix causes its deterioration throughout the body of the concrete. While his tests have been going on for some time, it seems to me that this subject is so important that it is inadvisable to rush at conclusions to the extent his paper would indicate. It does, however, give real food for thought to the technological staff of the cement manufacturers and if these conclusions are correct, their problem is before them.

We are all familiar, of course, with the chaotic condition of portland cement experimentation at the present time and with the efforts being made by many manufacturers to produce better materials, and which may automatically meet the criticisms which Professor Snader's experiments have developed. I believe that all men who have given much thought to the subject have come to the definite conclusion that the art of making good concrete and the science of making cement are still far from perfect, although there is no doubt but that we have already advanced a considerable distance since the first experiments. Unfortunately, concrete became a panacea for all ills—a foolproof material in its early stages of production—and in view of the burden it had to carry, the fact that it has done as well as it has under the

Cavity Formed by Removing Defective Concrete, Preparatory to Refilling

* Engineer of Bridges and Buildings, Pennsylvania, Central Region, Pittsburgh, Pa.



The Tower and Chute Were a Factor in the Trend Toward the Use of Excessive Amounts of Water in Concrete

normal indifference and ignorance of average construction bespeaks much in its favor. So far as one can predict, its use is going to continue and it is going to serve a real purpose in the future.

Unfortunately, the salesmen of concrete broadcast the term "permanent structure" in such a fashion that they almost came to believe themselves that this was one material that was permanent and would never require any attention, but which is not so for any known material. Therefore, the definition of the term "permanent" becomes a relative one, but I think that all right-thinking engineers are recognizing the fact that in setting up amortization figures for a structure built of concrete, there should be a fund for maintenance, something that was not done in most cases in the past.

Obsolescence Probably Most Destructive Element

By Bernard Blum*

My experience with concrete indicates that the word "concrete" does not necessarily cover permanent material. We all have had experiences in which concrete showed evidences of deterioration in a short time; and on the other hand we know of installations of concrete which apparently are in as good condition now as when the material was poured many years ago. In some instances examination has disclosed that improper aggregates were employed; and aggregates have received more attention in recent years. The various concrete associations have done much to improve the art of mixing concrete and prescribing for the selection of aggregates.

To evaluate the permanence of concrete in terms of years would be a difficult matter; but with well-selected clean sand and stone, and with properly manufactured and cured cement, we may consider concrete to be permanent to the extent that our experience indicates is necessary in this age of ever-changing conditions, in which obsolescence is probably the most destructive element.

To the writer, Professor Snader's article brings out the importance of the constituents of concrete, in the following order: (1) The portland cement, (2) the sand, (3) the mixing, and (4) the coarse aggregates. The article calls attention to the leaching effect of water on concrete, due evidently to the dissolving of the cement matrix. To obviate or minimize such effect it is apparent that the cement is of prime importance. In order that cement may adhere to the sand it is important that the fines be of proper gradation, have maximum sharpness and hardness, and be thoroughly cleansed.

The selecting and washing of coarse aggregates, while important, appear to be of lesser significance so long as materials are employed which pass ordinary criteria of durability and cleanness. The adherence of silt to the rock is of minor consequence. A certain percentage of fines is permissible, and the amount that will adhere to ordinary washed material is of minor consequence, for in the process of mixing the concrete such impurities are absorbed in the mortar.

It is my opinion that with further attention to the selection of materials, manufacture of cement, and mixing of concrete the percentage of failures will decrease. Without doubt much concrete in the past has been placed without proper regard to these important matters. The metallurgist has given much thought and endeavor to the manufacture of steel. When corresponding attention is given to the making of concrete, the failures of which Professor Snader speaks will to a large extent fade away.

* Chief Engineer, Northern Pacific, St. Paul, Minn.

Deterioration Varies With Degree of Exposure

By G. A. Haggander*

Much of the concrete on our railroad is 25 or 30 years old. Systematic inspections show that signs of deterioration often begin to appear after 10 or 15 years. Practically all of the deterioration takes place on surfaces exposed to moisture, such as the ends of piers, outside faces, and the parapets of concrete slabs, wing walls of concrete boxes, etc. Almost, without exception, the portion that is protected from moisture remains in good condition.

On many structures there is a decided difference in the condition of the concrete on the two sides of the track. This is apparently due to one side being more exposed to the elements than the other. In certain valleys the side toward the river, which is exposed to more moisture, to the prevailing winds, and to more sun, is in worse condition than the side toward the bluff, which is more protected and has a more uniform temperature. The condition of the concrete structures on our railroad seems to vary with the annual rainfall, there being less deterioration on the western parts of our line where the annual rainfall is from 15 to 20 in., than on the eastern part where the rainfall is 35 to 40 in.

I am firmly convinced that Professor Snader's first four conclusions are quite correct. We have some difficulty with deterioration which can be traced to the quality of the aggregate but our experience is somewhat different from that arrived at by Professor Snader in conclusion No. 5.

Until 1923 a great many of the structures on the Burlington were constructed of concrete containing pit-run gravel from the Fox River valley in Illinois. This is ordinarily considered to be a good grade of material but it contains a small percentage of soft stone which absorbs water and causes fractures near the surface of the concrete during freezing weather. Once these fractures occur, the disintegration may become progressively worse. We have had some experiences with early concrete in

* Bridge Engineer, Chicago, Burlington & Quincy, Chicago.

which soft limestone containing chert was used, and also some experience with gravel, dredged from rivers, which contained chert. In general, our difficulties have usually been due to a combination of poor aggregate, mentioned in conclusion No. 5, and too much mixing water, mentioned in conclusion No. 6. Deterioration has not been so severe that the safety of the structures is involved and we feel that repairs can be made which will restore the structures and increase their life indefinitely.

As Professor Snader states, for every sample of unsatisfactory concrete there are many satisfactory ones. Generally, only a small portion of any one structure shows signs of deterioration, indicating that if the entire structure had received the same treatment as the sound portions, it would have been satisfactory as a whole. For example, in a five-span concrete pier trestle 23 years old the piers, which were built of pit run gravel with five sacks of cement per cubic yard of gravel, are in perfect condition, nine of the slab faces are badly deteriorated, while the tenth is nearly perfect. Seven sacks of cement per cubic yard were used in the slabs, with the same aggregate as was used in the piers. However, an integral waterproofing was used in the slabs, but the condition of the concrete cannot be attributed definitely to this on account of the perfect condition of one slab. There is evidence that very wet concrete had been used, as was the custom in 1914, and the condition of the slabs may be due to this. Because the piers, with less cement per cubic yard, are in good condition, the drawing of any definite conclusion concerning this structure becomes very difficult.

During the last 14 years more care has been used in the selection of aggregates, washed and graded aggregates being generally used. The question of mixing water and concrete proportions has also been given study, with the result that we anticipate much better service with less maintenance on our present concrete work.

My experiences with the older concrete structures has not caused me to lose faith in concrete and in most cases it is a material for which there is no ready substitute. I have tried, however, to avoid extremely thin sections, so that when deterioration does occur (as it will no doubt occur in many structures), the safety of the structure will not be jeopardized and there will be an opportunity for restoring it. We cannot assume that a concrete structure is permanent and will require no maintenance, but I do not anticipate that the cost of maintenance will be excessive.

I estimate the valuation of concrete in bridge structures on the Burlington as roughly $10,000,000. During the last few years we have expended approximately $20,000 per year on repairs to concrete, or about two-tenths of 1 per cent of the value of the material, and our present judgment is that an annual expenditure of about this amount will be sufficient for a great many years.

Further Study Should Be Undertaken

By E. A. Frink*

As the author states, all natural stones are susceptible to change by natural forces. But there are large variations in the rate of such change between different stones and even between the different varieties of the same stone. Some forms of granite decompose more or less rapidly, while others, although exposed to the action of natural forces, have apparently remained unchanged for ages. From the writer's experience, this same statement seems to be true about concrete structures.

In his concluding paragraph, the author states "every sample of unsatisfactory concrete which has been studied, could be matched with hundreds of examples of concrete which have given excellent and fully satisfactory service. In fact, in some structures where deterioration has occurred, large areas of concrete still appear to be sound and satisfactory." This leads to inquiry as to the cause of cement deterioration occurring only in certain structures and even in only certain parts of the same structure. If the cause of the failure is because of the contact water, why are not failures more general? Why does not damage always appear at the water line on piers built in water?

For many years the writer has had occasion to examine many concrete piers built in salt and fresh water and cannot remember one that showed any deterioration at or near the water line, notwithstanding the fact that some of the piers, when examined, had been built for 30 years. It is needless to state that for concrete built even 30 years ago, conditions were not as favorable for the production of good concrete as they are today. The writer believes further investigation is needed to determine the cause of cement failure. It does not seem to be solely the result of contact water and hydrated cement, because in so many cases this combination has not resulted in damage. It seems improbable that the cause is inherent in certain kinds of cement because, if so, all foundations of a given project as well as all parts of a single structure would be apt to show deterioration to some extent. Therefore, it seems possible that the cause of the trouble must be looked for in the mix, its proportions, its density, the amount of mixing water used, the time of mixing, the elapsed time between mixing and depositing, etc. Perhaps too much effort has been devoted to increasing the strength of the concrete at the possible expense of its durability.

Under present conditions, the use of concrete is practically unavoidable, but should be surrounded with the best conditions practicable. Until such time as more information is available, structures should be designed for reasonably low unit stresses, adequate coverage for all reinforcement should be provided, a mix as dense as practicable and not lean in cement should be used, and very careful supervision of every step in mixing and placing of concrete should be provided. Proper supervision is perhaps the most important feature in concrete construction and should never be slighted. With these precautions, the writer believes dependable and durable concrete construction will usually be obtained.

Cement Only One Factor To Be Considered

By Meyer Hirschthal*

At the last meeting of Committee C1 (Cement) of the American Society for Testing Materials, one of the members stated that defects in concrete work and the subsequent deterioration of concrete had been eliminated by means of a specification calling for particular care in the burning of the cement and by careful inspection of this particular item at the cement mills. This viewpoint is evidently very similar to that of Professor Snader, who implies that concrete deterioration is traceable to the poor quality of cements furnished by the mills.

The writer believes that his reply to the above statement applies also to the article just referred to. If memory serves, it was as follows: "If all defects in concrete could be traced back to the cement, our troubles would be greatly reduced and the remedy would be fairly simple

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as it would be concentrated on one item. Unfortunately, a large number of factors involving both a number of materials and processes of manufacture enter into concrete making."

Without holding a brief for the cement producers, I contend that if half as much care were exercised on the average construction job in the selection of materials, workmanship and supervision as is done in the cement plant, fewer concrete failures would result.

A generation ago, it was the common assumption that once a concrete structure had been completed it would require no further attention. This point of view is indicated in the following statement abstracted from a paper prepared by the writer in December, 1936, for the American Concrete Institute.

"As recently as 25 years ago, whenever an important bridge was projected by the Delaware, Lackawanna & Western, comparative estimates would be made for both a structural steel and a reinforced concrete structure. In making these estimates there would be added to the estimate of steel construction (or credited to the cost of the reinforced concrete structure) the item of the capitalized cost of maintaining the steel structure. This obviously implied that it would be unnecessary to spend any money for maintenance of the concrete structure."

This paper embraced a report on the condition of 45 concrete structures on the Lackawanna, based on an examination of them after more than 25 years' service. Space does not permit of a detailed description here but, in general, it may be said that they have given an excellent account of themselves, but on the other hand they are not perfect.

Summarizing the main causes of cracks or deterioration in these structures without attempting an exhaustive list, the classification is as follows:

(a) Structural

1. Unequal settlement of foundation of the structure—at times resulting from failure to separate parts of structures resting on soils of different bearing power.
2. Failure to provide distinct joints at changes in cross-section.
3. Failure to provide against distortions transferred by main members which are subject to change in configuration as a result of temperature changes (such as spandrel construction surmounting arches).
4. Failure of joints (chiefly sliding joints) to act as designed.
5. Failure of drainage system—included in this item is failure to anticipate accumulation of water in areas not intended to carry water, such as platforms or cinders supported by slabs of structures.
6. Failure anywhere to provide for volume changes due to shrinkage or to temperature changes.

(b) Installation—Material or Methods

1. Unsound or faulty materials—any of the ingredients in the concrete.
2. Excess of water in the mix.
3. Water gain in placement.
4. Segregation in placement.
5. Closeness of reinforcement to exposed surface. It may be noted that remarkably few instances of this error were found in the structures examined.
6. Formation of laitance at joints or temporary stoppage of concrete pour.
7. Insufficient curing.

We Have Indulged Too Largely in Theory

By P. G. Lang, Jr.*

Professor Snader's report is a most valuable contribution to engineering literature, and merits thoughtful study by all whose duties concern the design, construction or maintenance of concrete structures. It is a source of gratification that the author has simplified this complex subject by limiting his report to concrete in *normal* service, and, further, to its cement constituent. The conclusions formulated are vital, and logical to a degree which admits of no controversy.

As one of the few points of this excellent paper which are open to discussion, Conclusion 10 (a) may be quoted:

"However, in view of the naturally porous nature of even the best concrete, it is difficult, and the writer believes it to be impossible, to thus obtain a fully satisfactory degree of impermeability."

This conclusion may well be studied in conjunction with the following statement, which appears toward the end of the paper:

"Finally, the writer must call attention to the fact that, although he has concentrated attention on the problem of deterioration in concrete, he recognizes that every sample of unsatisfactory concrete which has been studied could be matched with hundreds of examples of concrete which have given excellent and fully satisfactory service."

All things human are divested of mystery when exposed to the light of rational investigation. Every reasoning process, whether mathematical or otherwise, must be based on certain assumptions, which may or may not be correct. Thus, while the conclusions, on the basis of the assumptions, may be entirely correct, the soundness of the assumptions themselves may be open to question.

We have, perhaps, indulged too largely in subtle theory concerning the requirements for the production of good concrete, including the water-cement ratio, the fineness moduli, etc. The actual requirements are few and simple—good coarse and fine aggregates, cement and the proper amount of water to hydrate the cement; the other prime requisite is density. It seems trite to say, but it is nevertheless a fact, that the coarse and fine aggregates are natural products, prepared by man. Water is a natural product. However, these natural products alone cannot make good concrete. Cement, the necessary element, must be added. Certainly the claim has never been seriously advanced that an excess of cement is deleterious to concrete, although considerable energy has been expended in advising us how to make better concrete with less cement.

In too many cases failure or deterioration of concrete has, after an investigation, more or less thorough, been attributed to one or more of a number of conventional factors, including the use of too much or too little water, the quantity of cement, faulty mixing or curing, etc.

Faulty Concrete at the End of a Wing Wall Parapet

* Engineer of Bridges, Baltimore & Ohio, Baltimore, Md.

Such conclusions have never seemed to cover the problem properly, especially since, for every unit of disintegrated concrete, it is usually possible to find, standing intact and in good condition, an adjacent structure, built at the same time under similar conditions and by the identical organization. Consequently the reasons usually given for failure of the concrete do not seem to fit the known facts.

Concrete is, in practically all cases, mixed at the site of the work, and any number of large structures may be cited where all of the subtle theory surrounding the subject has been reinforced by elaborate equipment, subject to supervision and inspection by concrete technicians. Even a casual visit to such a job will reveal that, in the final analysis, decision rests with the foreman or subforemen placing the concrete as to whether it shall be richer or leaner, whether it shall have more or less water, etc.

Tests of the strength or quality of concrete itself, or methods of placing it, may be of interest, but are of little practical value. Certainly it is impossible to remove the concrete placed in the foundation of an important structure 30 days after it has been poured, even though the tests indicate that it is not quite up to the specification requirements.

Another factor affecting this situation is the tendency toward the use of high-early-strength cement, with apparent disregard of temperature effects. Why should not the same result be achieved by using more ordinary cement? Certainly, all known materials are affected by temperature changes, and, as a result of such changes, undergo changes in volume. Such changes produce cracks, even though these cracks may be microscopic in character.

Further, there has been too much of a desire to disguise concrete, to cause it to resemble some other substance, and to provide an artificial finish of predetermined character. Good concrete must be honest as to its qualities, and, if it is such, will require no rubbing, plastering or other type of special finish.

The problem presented in the final conclusion is definite, and steps should be taken to solve it. Its solution is not impossible.

"In short, it is possible for the manufacturer to improve or modify cement as a manufactured product, so that if moisture does reach the hydrated cement binder of the concrete, the resulting products of original hydration will not be broken down, and so that the cement matrix will not lose its original cementing properties and deterioration thus be retarded."

The Best Concrete Will Not Last Forever

By J. B. Hunley*

The Big Four was an early user of concrete, and in 1902 inaugurated a heavy reconstruction program which was continued, with scarcely any interruption, for 30 years. The large volume of concrete, involved in this work, was used, mainly, in many comparatively small structures, rather than in a few large ones. They are located in an east and west belt subject to many cycles of freezing and thawing. They were built under specifications in vogue at the time and the materials used were obtained from several different sources, but were similar in character.

Any prediction as to the expected life of a unit of concrete must take into account its case history. If its present condition, either good or bad, can be accounted for, it is much easier to estimate its future life. A brief review of the various methods used in making this concrete, and the observed results, may help to substantiate the conclusion given later.

1898-1902

The earliest definite specification for concrete to be found consists of a single sheet covering the construction of a 14-ft. arch in 1898. It defined the proportions to be used and required that all exposed surfaces be faced with 1:2.5 mortar, two to three inches thick. No mention was made of the amount of mixing water, or consistency.

During this early period and up to 1901, many piers and abutments were built with a natural cement core, faced with four to six inches of portland cement mortar. A few of them have been replaced, the first in 1917. They are easily identified, as the surfaces are checked with vertical and horizontal lines forming rectangles from four to eight inches high and one to two feet in length. This is seldom any marked disintegration of the facing itself, but when the applied load exceeds the supporting power of the natural cement core, the checked skin bulges and a complete structural failure may occur quite suddenly.

1902-1905

The first complete specification was issued in 1902. It specified rather rich mixtures and also contained these important clauses:

"It is understood that the proportions of stone and gravel are approximate and may vary with the character of the material, and must always be such that the mortar will fill all the interstices in the stone, when rammed.

"The concrete shall be put in in layers, at right angles to the direction of pressure in the structure, not exceeding six inches in thickness and be thoroughy rammed with iron rammers, and shall be of such consistency that the water shall just flush to the surface when rammed."

Given sound materials, an experienced inspector, with this specification, one could produce concrete quite as good as any obtainable today. The dry, rich mixtures were dense, and even though unwashed and pit run aggregates were used, these structures are generally in an excellent condition. In only a few instances was any attempt made to waterproof the backs of walls or abutments, or the tops of slabs and arch rings.

1905-1921

With the rapid growth in the use of reinforced concrete, it was assumed that more workable mixtures would be desirable, and naturally the simplest way of accomplishing this was to add more water. The 1905 revision required that: "The concrete shall be of such consistency that, when dumped in place, it will not require much tamping. It shall be spaded down and tamped sufficiently to cause the water to rise *freely*† to the surface but not materially above it." The use of premixed aggregates was permitted and the proportions were fixed as 1:2:4, 1:3:6, etc., with no provision for adjustment to compensate for variation in the size or grading of the aggregates.

This was the first backward step, which was per-

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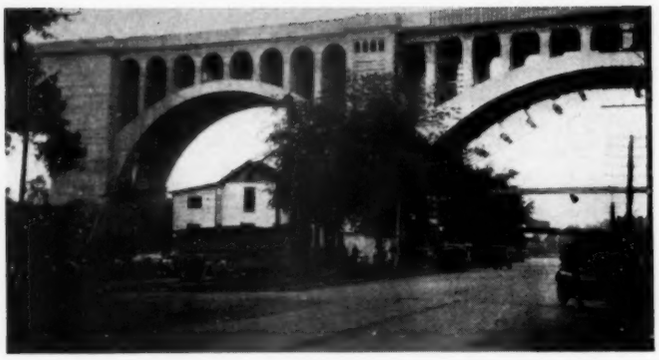
† The italics are mine.



Part of the Large Arch Viaduct on the Cleveland, Cincinnati, Chicago & St. Louis at Sidney, Ohio

petuated in the 1910 edition, the revisions dealing principally with the cement. The use of the chute had become popular, and the harsh wet mixtures, then in use, gave no little trouble. The "water cure" was again resorted to, and the 1915 specifications went even further, requiring that: "The concrete be a *wet*† mixture of such consistency that it will flow freely on a slope of four horizontal to one vertical. It shall be spaded down and leveled, causing the water to rise freely to the surface, but not materially above it."

These requirements conformed with the common practice, and unfortunately a great deal of concrete was so proportioned during this period. Large construction projects were under way everywhere and many, who had frowned upon concrete at an earlier period, when it was really much better, were now advocating its use for every purpose. But such specifications could only result in mixtures that segregated, and produced porous structures filled with leaky construction joints. Any of the photographs reproduced in Professor Snader's article illustrate very clearly the appearance of much of this work today. For the few sound examples, we are probably indebted to the contractor and inspector on the work who completely ignored the specifications and changed the proportions and consistency to conform with their old fashioned ideas.

In 1919, a bulletin by Professor Duff A. Abrams, on the "Design of Concrete Mixtures" was published by Lewis Institute. While the methods suggested were quite startling, there was much in their favor, in that they were in direct conflict with the then current practice. If these recommendations could be put into practice, they pointed to a way of correcting some of the faults which, by that time, had become so obvious. As a result new specifications were issued in 1921, largely for experimental purposes. No attempt was made to fix the water cement ratio at that time, as this seemed quite impossible. Neither was there a radical revision in the proportion of aggregates or cement. The company furnished all materials, and it was the intention to control the size and grading of the sand and stone, at the pit, or on the work, using three different sizes, if necessary, and combining them in such proportions and with such a quantity of cement as would avoid segregation and produce smooth mixes. The minimum time of mixing was placed at 45 sec. and the concrete was to be of "such consistency as, and shall contain no more water than, is necessary to permit of proper working. It shall be spaded down, leveled and tamped, causing the water to rise to the surface. If water accumulates on the surface of the concrete, the amount used in the mix shall be reduced." Where chutes were used, it required that "they be steep enough to make the concrete run freely without using an excess amount of mixing water, but not steep enough to cause segregation of the stone and mortar."

A reissue of the 1902 specification would perhaps have served quite as well, but at any rate an attempt had been made to return to the sound practices of that day. The long retrogression in the art of making concrete had been costly to all concerned and it is fortunate, that the cement industry had the foresight to institute its great program of research, and was able to publish its findings, in time to check the rapidly waning confidence in concrete. As a result of this valuable work we approach the present stage.

1922

In 1922 the proportioning of concrete, on a strength basis, was employed in the building of a large concrete arch structure at Sidney, Ohio. Many difficulties were encountered, as the available data were based on laboratory experiments, using dry, rodded and artificially graded aggregates. It was necessary to establish a simple laboratory on the work, in which workability, density, strength and yield of concretes, and the bulking of damp sands were studied. A practical and satisfactory method of proportioning concrete was finally developed, although a definite specification was not issued for some years.

Needless to say, all concrete placed since 1922, and the volume is large, has been proportioned by this method. When necessary, adequate drainage systems have been installed behind walls and abutments, and structures have been waterproofed to prevent seepage, and, with a few exceptions, where it is obvious that inspection and control were neglected, this concrete shows no signs of deterioration. It is too soon, however, to hazard a guess as to its ultimate life, but considering the greater care exercised in the selection and inspection of materials, and the use of more refined methods of proportioning, it should be superior in quality to that placed 35 years ago, and which today is still generally sound.

Conclusions

The period, covered in this discussion, goes back almost to the beginning of the Concrete Era in this country, and the various methods used in its manufacture, as outlined, must have been followed by many others. A review of the results obtained would lead one to conclude that:

1. Concrete, being plastic, quick setting and available in many places at a reasonable cost, is an ideal material for many types of construction, but it has been too often used in the place of other materials more suitable for the purpose.

2. Deterioration of exposed concrete is due primarily to the use of an excessive amount of mixing water, resulting in porosity and the accumulation of laitance at construction joints. Such concrete collects and retains moisture and disintegrates rapidly when subjected to freezing and thawing.

3. With dry but workable mixes, properly proportioned and placed, it is possible to obtain a concrete sufficiently dense to prevent the absorption of harmful amounts of atmospheric moisture. When such concrete, however dense, is under a hydrostatic head, it should be well drained and, unless the sections are of unusual thickness, it should be waterproofed, and water stops should be provided at all construction and expansion joints. Few natural, and probably no artificial stones can indefinitely resist the effect of freezing and thawing and, where long service is required of concrete, careful consideration

should be given to the details of design and a reasonable amount of protection provided so as to minimize the effect of this inherent weakness. Had these precautions been taken, when some of the older structures were built, many of them would be found in a much better condition today, even though the concrete of which they were constructed was of inferior quality.

4. If concrete is dense enough to protect the aggregates, need we fear disintegration of the cement? Professor Snader's answer, based on laboratory analyses, is in the affirmative. The writer raised this very question some years ago, and after many visual examinations in the field he is still in doubt. Very little deterioration has been found in the portland cement mortar facings used in the oldest structures, and these have been exposed to the weather for from 35 to 40 years. Any serious disintegration of the cement should be apparent, because the core, in many instances, is of such a nature that it would have little sustaining power unless it were enclosed within a high strength sheath. A breaking down of the mortar has been found in structures, usually in the interior, accompanied by some one or combination of the following conditions:

(a) Obviously lean mixes, such as are occasionally found in external or internal pockets of otherwise sound concrete, and in the interior a few of the older structures built when it was sometimes the practice, for appearance sake, to appropriate such a large portion of the specified amount of cement for the outer surface, that the remainder was not sufficient to form a mortar to bind together the coarse aggregates in the backing. Such failures might reasonably be charged to lack of cement, rather than to its quality.

(b) Unsuitable coarse aggregates, used in unprotected porous concrete. In such cases the first failure is frequently found in the stone, and it might be assumed that the wedging or explosive force, developed during this first step in disintegration, shattered the mortar. This assumption would be more acceptable if the mortar were always found broken up into large particles, but it is often pulverized, which may indicate a weakness in the cement.

5. Dense concrete, made of sound materials properly proportioned and placed, and protected against seepage, when necessary, should have a sufficient life, for many purposes. This is evidenced by many structures which show little deterioration after many years of service.

However it is doubtful if we can expect, with certainty, to produce such concrete in every case. With the best of intention on behalf of every one, a lapse in control may produce a local but serious defect, which will materially affect the life of the structure. Such instances occur too often to warrant the statement that all concrete, as made today, is permanent, and even the best of this concrete cannot last forever.

Highway Freight Carriers Classified by I. C. C.

THE Interstate Commerce Commission has issued a report and order setting up a classification of brokers and motor carriers of property in accordance with section 204(c) of the Motor Carrier Act. This section authorizes the commission to establish "such just and reasonable classifications . . . as the special nature of the services performed by such carriers or brokers shall require; and such just and reasonable rules, regulations and requirements . . . to be observed by the carriers or brokers so classified or grouped." Believing that it is not now desirable "to define strictly each type or kind of carrier or broker," the commission's basic purpose "has been to ascertain and define generally the natural divisions which are now present in the industry." In so doing it has "refrained from attaching to any group rules or regulations applying to the transportation activities of the group." The necessity for such "will be dealt with in separate proceedings."

The report by Division 5, comprised of Commissioners Eastman, Lee and Caskie, discusses in turn the need for classification and the scope of the investigation upon which the findings are based. Findings are set forth in an appendix wherein is found the accompanying chart showing the prescribed classifications in graphic form.

The Classification Chart

This chart outlines three steps taken in the breakdown of each motor carrier operation. These three steps are the analytical factors which are used to determine the carrier's classification. They include (1) type of carrier, (2) type of carrier's service, and (3) type of commodities transported. Each class is a composite of these three factors. The chart includes a symbol system through which each class may be identified by a code letter and number.

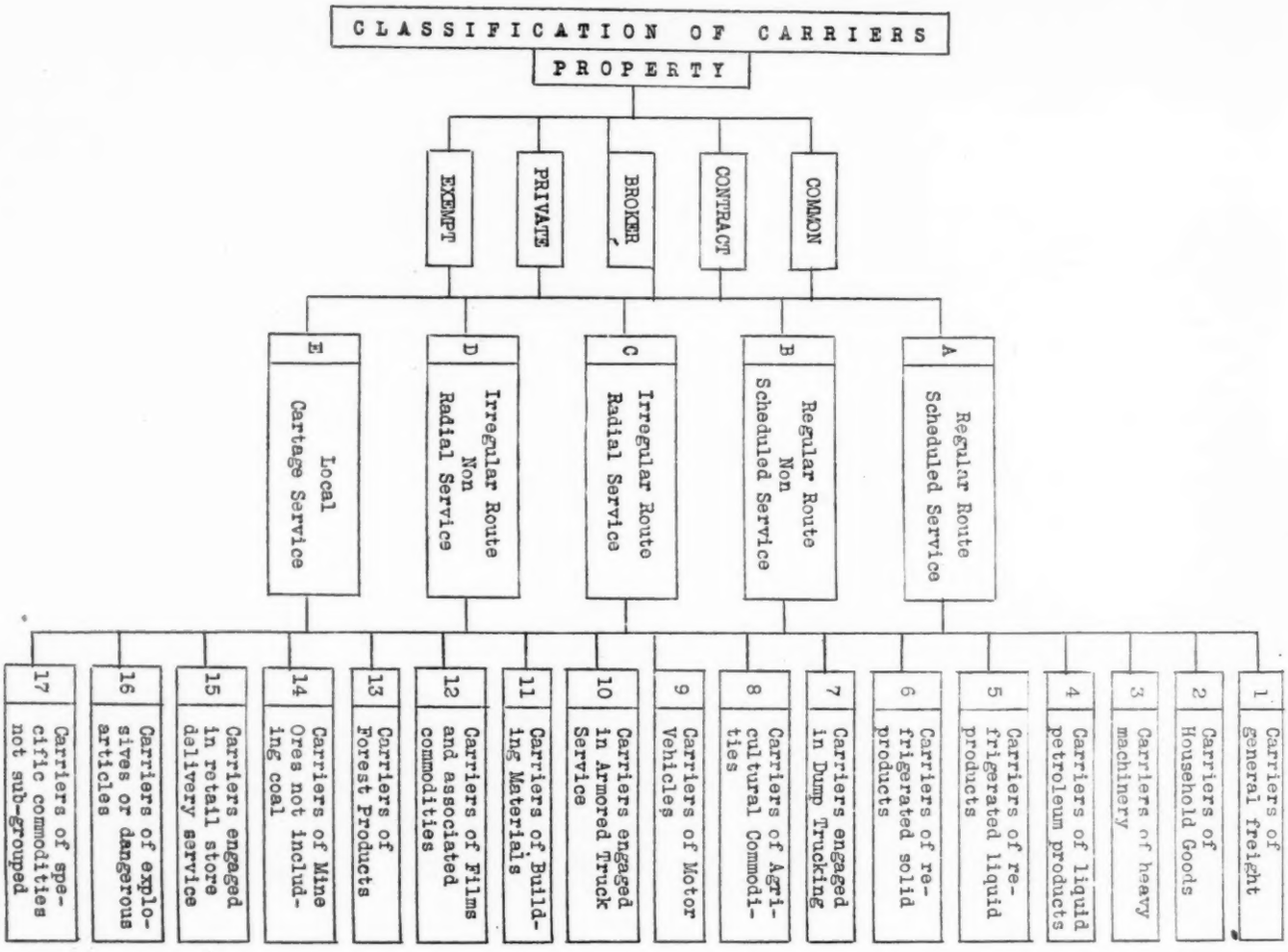
The first division on the chart identifies the type of operation, as fixed by the Motor Carrier Act. There are five such types of property operators. The second division identifies the type of service in which the carrier is engaged. The third division describes the type of commodities transported by the carrier. There are 17 such commodity groups which were considered of sufficient importance at this time to warrant individual identification. Additional groups may be added as the need therefor is shown.

The symbol system of code identification is derived from the foregoing three groups. For example a common carrier may be engaged in transporting household goods over irregular routes in radial service. Such a carrier would be classed as a Common Carrier class C-2.

After its explanation of the chart along the foregoing lines the appendix follows with detailed definitions or explanations of each class or group of carriers. It is pointed out that the classifications and groupings are prescribed for general purposes, and that operations of an individual carrier may fall within more than one grouping. In such an event the latter becomes subject to such rules and regulations as may be prescribed for each group into which it falls.

Need for Classification

The need for the classification, the report says, arises, among others, from the fact that identification will tend to facilitate regulation. This is regarded as particularly important at this time in connection with the issuance of certificates and permits. It is pointed out, however, that the problem is made difficult by the fact that a large number of operators have "grandfather clause" rights, and "it is not always easy to fit such operators into a definite classification." This situation, the report continues, "precludes any finding which does not make provision for each major type of operation present in the industry today." And the commission is "impressed with the fact that a practical classification must not only provide a satisfactory operating sphere for each kind and major type of operator now in existence, but it must also avoid the danger of establishing restrictions which might be burdensome to the industry."


CLASSIFICATION OF CARRIERS
PROPERTY
COMMON
CONTRACT
BROKER
PRIVATE
EXEMPT
A Regular Route Scheduled Service
B Regular Route Non Scheduled Service
C Irregular Route Radial Service
D Irregular Route Non Radial Service
E Local Cartage Service
1 Carriers of general freight
2 Carriers of Household Goods
3 Carriers of heavy machinery
4 Carriers of liquid petroleum products
5 Carriers of refrigerated liquid products
6 Carriers of refrigerated solid products
7 Carriers engaged in Dump Trucking
8 Carriers of Agricultural Commodities
9 Carriers of Motor Vehicles
10 Carriers engaged in Armored Truck Service
11 Carriers of Building Materials
12 Carriers of Films and associated commodities
13 Carriers of Forest Products
14 Carriers of Mine Ores not including coal
15 Carriers engaged in retail store daliyery service
16 Carriers of explosives or dangerous articles
17 Carriers of specific commodities not sub-grouped

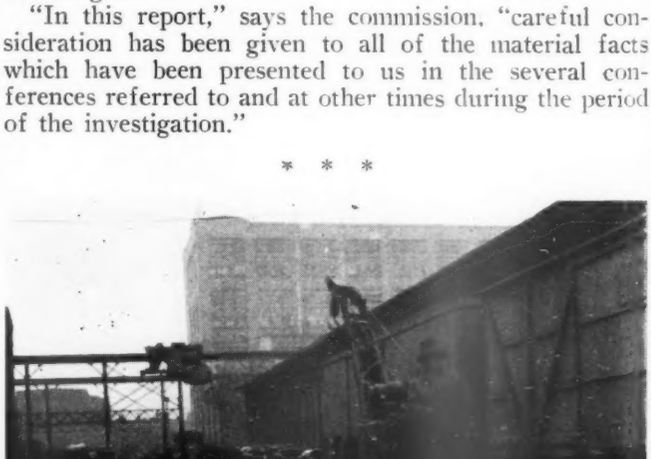
With due regard for these considerations, however, the commission believes that a classification is necessary, since through such a set-up regulations can be made to apply to such classes as require special treatment. It is recognized that additional special groupings may be required in instances where regulations may depend on factors other than those used as the basis for this classification. In the latter connection it is suggested, for example, that accounting rules might be applied to groups classified in accordance with their annual gross income. In other words, while the investigation "indicates that it is not possible to establish a general classification which would meet all of the needs for groupings in connection with accounting, safety, or other special problems, it is clear that a general classification can be used to excellent advantage in all of these matters. Those problems which require special groupings will, therefore, be considered separately as a part of such regulations as may be promulgated pertaining to those particulars."

Scope of Investigation

In the investigation, representatives of the Bureau of Motor Carriers interviewed representative operators and representatives of motor carrier organizations. A tentative draft of a proposed classification was prepared as a result of these studies and interviews and submitted to the industry. Criticisms and suggestions were invited. Consideration was given to suggestions and criticisms which were received as the result of this tentative draft. A second draft was then prepared. In this revision an endeavor was made to incorporate all suggestions which had been received and which appeared to be pertinent. This revised draft was distributed to all interested parties of record and further criticisms and suggestions invited. Based upon the information and data received, a third draft of a proposed classification was prepared and submitted to a general conference of carriers and carriers' representatives held in Washington.

"In this report," says the commission, "careful consideration has been given to all of the material facts which have been presented to us in the several conferences referred to and at other times during the period of the investigation."

* * *



Crane Trucks and Trailers in Shop Transportation

The New York Central System Modernizes Passenger Cars

One of the Modernized Diner-Lounge Cars

Program covers 103 cars — Includes air conditioning, modern lighting, new seats and redecoration

AN extensive program of passenger-car modernization involving a total of 103 cars was completed by the New York Central System during the first half of 1937. The program comprises 75 coaches, of which 50 are for the New York Central, 17 for the Boston & Albany, and 8 for the Pittsburgh & Lake Erie; 25 diner-lounge cars, 24 of which are for the N. Y. C. and one for the P. & L. E., and also 3 diners for the Boston & Albany. The program was carried out at Beech Grove, Ind., West Albany, N. Y., and Allston, Mass.

The program consisted of air conditioning all of the cars, the installation of new seats and improvement in toilet and lavatory facilities in the N. Y. C. coaches and the installation of separate smoking and lounge rooms for men and women and re-upholstering seats in the P. & L. E. coaches. The seats in the B. & A. coaches were also re-upholstered. In fitting up the 25 diner-lounge cars provision was made in the dining section for accommodation of 18 persons with 11 chairs in the lounge section. New lighting fixtures have been applied on most of the equipment and the amount of illumination in the coaches greatly increased. A rubber-insulated stay-rod support is applied to the diaphragms and buffers, by means of which they are top supported, and the couplers isolated from the car body by sound-insulating material applied to the coupler-shank suspension. The original trucks remain under the cars. On the coaches, however, the 5½-in. by 10-in. axles have been replaced by special 5½-in. by 10-in. axles, which have the dimensions of the standard 6-in. by 11-in. axle between the journals. On the dining cars the 5-in. by 9-in. axles have been replaced by 5½-in. by 10-in. axles, except for those from which the generators are driven. These are 5½-in. by 10-in. special axles similar to those under the coaches.

The cars, some of which are not over ten years old, required no structural changes, the principal alterations being the closing of the deck ventilator openings, lowering the ceiling, installing an air-distribution duct for the air-conditioning system, and the application of new floors. No changes were made in the double windows with which the cars were originally equipped, except for the application of new weatherstripping.

Passenger-Coach Interiors

In the coaches the floors, ceilings and sides below the window sills were removed. No changes were made from the clerestory deck to the top of the windows. An additional layer of ½-in., two-ply Hairfelt insulation was applied on the inside of the roof and two additional layers were installed in the sides of the deck. An air duct 36 in. wide by 9-in. high, with a cross-sectional area of 324 sq. in., was installed under the roof, supported on light transverse pressed channels which are further lightened by cutouts in the webs. The aluminum ceiling is secured below these light cross-members at a height of 7 ft. 10$\frac{1}{16}$ in. above the top of the cork floor. One-half-inch cork insulation is applied around the duct. From an opening in the bottom of the duct the air passes to a 3-in. outlet along the longitudinal center line of the ceiling. Shutters are applied to this outlet, by the adjustment of which uniformity of distribution is effected. Below the outlet is a diffuser plate, over the lips of which the cold air enters the car about 11 in. on either side of the center line.

One of 50 Reconditioned Coaches for the New York Central

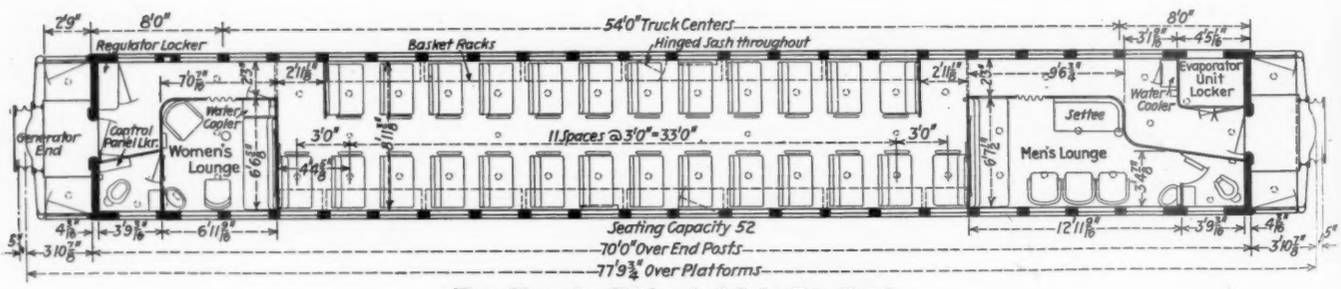
Interior of a New York Central Coach

The new floor construction consists of a layer of Dednox over the Chanarch floor supports, then a thin layer of rubber Dednox, and on this a layer of ½-in. slab cork. The top floor is ⅛-in. linoleum. New Masonite panels are applied on the side walls below the windows. Flexboard panels ⅛ in. thick are applied to the pier panels, separated from the original surface by a ¼-in. layer of Salamander. The Flexboard is secured on each side by pressed angle binders which are screwed in place under the parting strips. In the application of the ducts and ceilings, etc., extensive use was made of self-tapping screws.

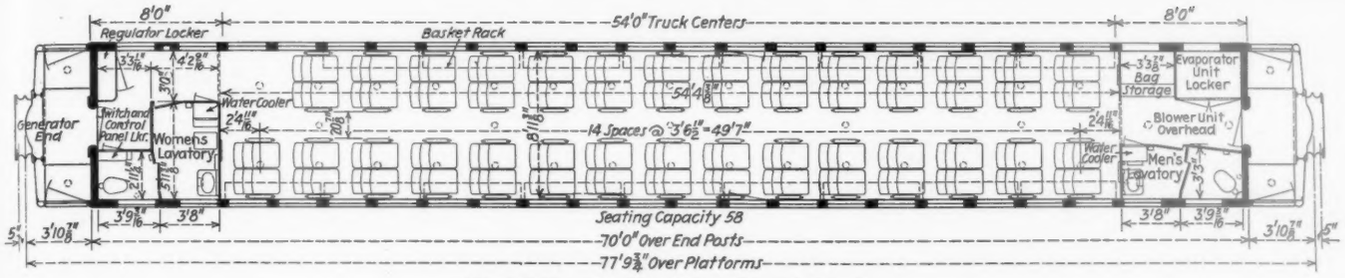
The 50 N. Y. C. coaches are fitted with new seats throughout. These are of the rotating, reclining type, with individual reclining backs. The seats for 30 of these cars were furnished by the Heywood-Wakefield Company, 10 by S. Karpen & Bro., and 9 by the American Car and Foundry Company and one by the Coach & Car Equipment Corporation.

All are fitted with either Dunlopillo or Mishawaka rubber seat cushions and in the case of the nine car sets of seats supplied by the American Car and Foundry Company Mishawaka rubber is also used in the seat backs. The one car set of Coach & Car Equipment Corporation's seats are upholstered in top grain leather. The upholstery for the seats in 10 of the N. Y. C. cars and the 17 B. & A. coaches was furnished by L. C. Chase & Company, Inc. That in the remainder of the N. Y. C. and P. & L. E. cars is a mohair of low pile construction, furnished by the Massachusetts Mohair Plush Company. Several patterns and colors were used.

The original lighting installation consisted of deck



Floor Plan of a Pittsburgh & Lake Erie Coach



Floor Plan of a New York Central Coach

sill fixtures placed 72 in. apart, with the fixtures staggered on opposite sides of the car. The lamps were 32-volt, 25-watt, and each was fitted with an opalescent shade. The spacing of these lamps provided one lamp over each alternate space between seats.

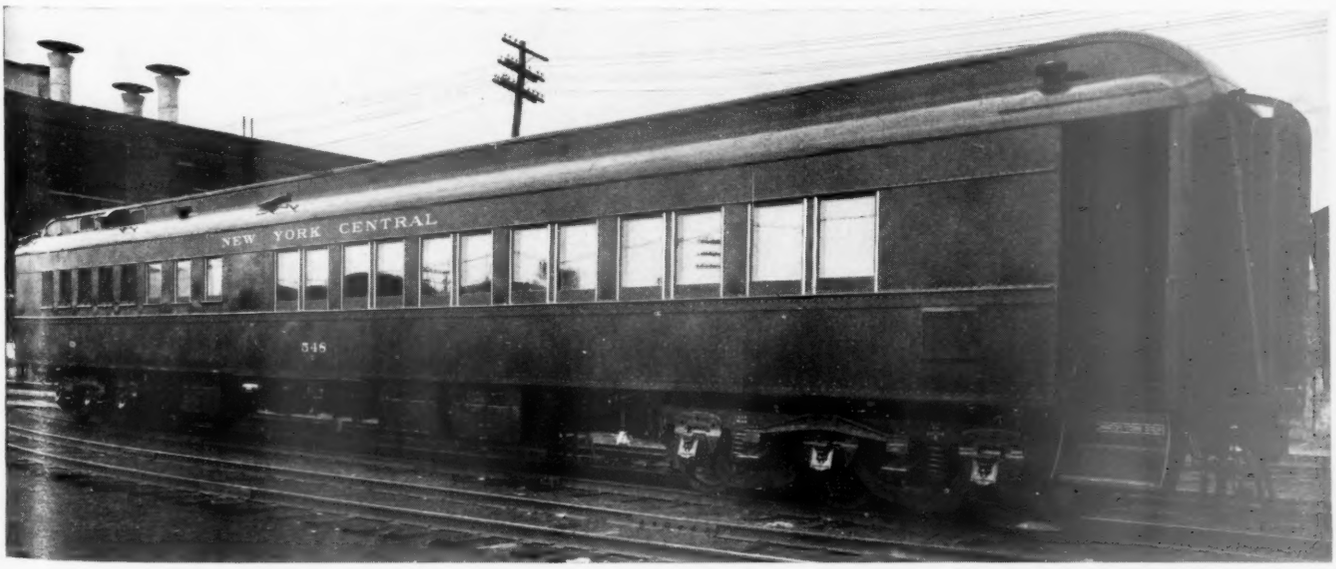
In the new lighting installation the principal illumination is still secured from fixtures located at the deck sill. The fixtures are spaced, however, so that there is one over each seat, and 40-watt, 60-volt lamps are used. Fixtures of three kinds were applied, all of which are of the controlled-distribution type. The changes have increased the illumination to approximately double the intensity at the reading plane of that obtained from the original installation.

There are also five light fixtures, recessed into the air-deflector plate below the longitudinal center line of the ceiling, each fitted with a 10-watt lamp. These are intended for night lighting only, when it is desirable to turn off the deck fixtures to permit passengers to sleep. The illumination from these lamps is sufficient to permit conductors to read tickets and passengers to move about the car without difficulty.

The women's lavatories of the N. Y. C. coaches and the men's and women's lounges of the P. & L. E. cars are equipped with 30-watt Lumiline mirror lights, in addition to ceiling lights similar to those in the main passenger compartment. The men's toilets and lavatories of the N. Y. C. coaches are lighted by fixtures of the original deck-sill type, using 40-watt lamps. The platforms and passageways are lighted with lens type units mounted flush in the ceilings with 25-watt lamps.

Several combinations of color and upholstery have been used in decorating the interiors of the coaches. One

Interior of a Pittsburgh & Lake Erie Coach



A Diner-Lounge Car

combination includes ivory ceilings, with straw yellow behind the luggage racks and on the end bulkheads, buff on the Flexboard pier panels and tobacco brown wainscoting below the windows. The linoleum floor is black, mottled with white, and the short-pile mohair upholstery is a two-tone brown in a plaid pattern. The window curtains are faced in brown, matching the lighter tone of the upholstery. Others of the cars are decorated with pearl-cream ceilings, tan on the end bulkheads and sides above the windows, with light gray Flexboard pier panels and buckeye brown wainscoting. In these cars a tan linoleum, mottled with brown and black, is laid on the floor. The window shades are a soft green. Some of these cars have rust-colored upholstery and others are upholstered in tan.

The Diner-Lounge Cars

The principal change in the interiors of the dining and diner-lounge cars was the installation of the air-distribution duct and the lowering of the clerestory ceiling. In the case of the converted diner-lounge cars glass and metal partitions were installed, separating the dining room from the lounge. The changes in the clerestory are similar to those made in the coaches, although the ceiling has not been dropped as far and the area of the air duct has been reduced to 261 sq. in., with a height of 7½ in. instead of 9 in. as in the coaches. The air is distributed in the same manner, except that the original dome type lighting fixtures are mounted directly on the center line of the ceiling, thus breaking the continuity of the diffuser plate and ceiling outlet.

The walls of the diner-lounge cars are finished in two tones of gray, with light cream headlinings. The molding between the ceiling and sides is finished in gray, relieved with a single red stripe. The silk window-curtain facings are gray, with a silver Pantasote facing at the bottom. Color is added to the room by the use of red leather upholstery on the dining chairs and a dark turquoise carpet which covers the floor, both in the dining room and lounge. The chairs in the lounge are of simple, modern lines. The frames of those in some of the cars are of aluminum and, in others, wood. Several patterns of upholstery in turquoise, amber and red tones are used in each car.

The lounge desk and magazine table are walnut, with black Micarta tops. The partitions separating the dining room from the lounge are Hylite panels, relieved with vertical stripes of Magnalite glass. The former is a slightly wavy, scatch-line surface, and the latter is prismatic in effect. These panels are set in aluminum frames with alumilite finish.

The air-conditioning installations on all of the cars are of the electro-mechanical type and include Frigidaire, Airtemp, and General Electric equipments. The compressor and condenser units are underframe mounted, and the evaporator units floor mounted in a compartment at one end of the car. The motor and blower fans are mounted above the ceiling.

The cars are fitted with 20-kw., 80-volt generators and 600-amp. hr. batteries. The lamp regulators are set to give 60 volts, corresponding with the voltage of the lamps, at the center of the load. The use of the 60-volt, rather than the 64-volt lamps, gives greater illumination when the train is standing or running below the cut-in speed of the generator. Both Safety and General Electric generators have been used. The former are body mounted and fitted with Spicer drives. The latter are truck mounted.

The cars are fitted with Vapor thermostatically controlled heat equipment, with fin-tube side-wall radiation.

Train Union Chiefs Say We Fool the Public

CHARGES that the Carriers Conference Committee of Managers "stresses the hourly wages of railroad employees in attempting to justify its opposition to wage increases" and that "Samuel O. Dunn, editor of the *Railway Age,* in the September 4 issue of that magazine, does a neat job of fooling the public with respect to the earnings of railroad workers," were made by the five brotherhoods of engine and train employees at Chicago this week during mediation of the demands of the brotherhoods for a 20 per cent increase in pay, which Dr. William M. Leiserson, a member of the National Mediation Board, has been conducting since August 28.

The charges were not a part of the mediation, but were made in a press release distributed by the brotherhoods on September 13. While the release attacks the Carriers Conference Committee of Managers for stressing hourly wages, it directs most of its effort to refuting the *Railway Age* editorial of September 4, which contended that train and engine service employees, with the exception of those in yard service, have already received an advance in hourly earnings over the pre-depression pay level. A reply to the charges of the brotherhoods was made by Mr. Dunn. Abstracts of both statements follow:

"Because trains have been speeded up and these employees now make their mileage in less time, it does not mean that they have more total income. Many of the railroad workers we represent are paid on a mileage basis and their bacon and eggs cost just as much, even though they make their runs in somewhat less time than in previous years. Hourly earnings mean little when it comes to paying the grocer and landlord.

"Samuel O. Dunn, editor of the *Railway Age,* in the September 4th issue of that magazine does a neat job of fooling the public with respect to the earnings of railroad workers. He presents a lengthy list of various classes of railroad workers and shows their 'hourly wages' in 1929 and 1936. He shows an increase in hourly earnings, except in those cases where the workers are not paid on a mileage basis, such as yard foremen, yard helpers, yard engineers and yard firemen. To one informed on the method of calculating railroad wages, this fact would prove that Editor Dunn was not presenting a true picture of the incomes of railroad workers, but was only showing the increases in train speeds in 1936 as compared with 1929, as such speed is reflected in his erroneous assumption of the hourly earnings of employees.

"The fictitious hourly rates create an error of as much as $4.11 per day more than the railroad employees actually receive. But when it is considered that hours are not the unit on which engine, train and yard service employees are based, it should be obvious that the carriers are selecting this fictitious basis for purposes of misleading the public. The public is vitally concerned in such efforts of the carriers to deceive, because if the reports of the railroads to the Interstate Commerce Commission are as inaccurate as their statistical propaganda, the public may be cheated out of millions of dollars in the fixing of freight and passenger rates."

Mr. Dunn's Reply

"The issue between the labor leaders and the *Railway Age* is easy to state. It is whether a man's *average hourly earnings* should be computed by dividing his total

earnings by the number of hours that he *actually works* or by some other figure.

"The *Railway Age* said that 'the average freight train crew earned its basic day's wages in May, not in eight hours, but in a little over six hours.' The accuracy of that statement has not been and cannot be disputed. But the so-called 'basic day' in train service is eight hours. The labor leaders contend that the average hourly earnings of employees in train service should be arrived at by dividing their daily earnings by eight. The *Railway Age* contends that their average hourly earnings should be arrived at by dividing their daily earnings by the number of hours that they *actually* work—that is, an average of slightly more than six hours a day.

"The public can choose which of these two methods of computing it prefers. But it will still remain a fact that the *average freight train crew does now earn its daily wage by working an average of a little more than six hours.*

"The *Railway Age* showed in its editorial that increases in the speed of trains between 1929 and 1936 had reduced the number of hours per day employees in train service have to work for a day's pay and had thereby increased their average earnings per hour. 'For some classes of train and engine employees,' the *Railway Age* said, 'the increases are as much as 16 or 18 cents an hour,' or as much as 11 to 16 per cent. The transportation brotherhoods reply: 'Because trains have been speeded up and these employees now make their mileage in less time it does not mean that they have more total income. Many of the railroad workers are paid on a mileage basis and their bacon and eggs cost just as much even though they make their runs in somewhat less time than in previous years.' This is true; but it does not alter the fact that the speeding up of trains has reduced the number of hours that these employees have to work to get a day's pay, and consequently has given them both more leisure and higher average hourly earnings.

"As the transportation brotherhoods referred to the 'total income' that these employees have available with which to buy bacon and eggs, the public may be interested in the following facts regarding their 'total income.'

"According to reports of the Interstate Commerce Commission, average *weekly* earnings of road and yard engineers in the first four months of 1937 were $58.83; of road conductors, $54.02; of road and yard firemen, $40.66; and of other road and yard trainmen, $36.84.

"Average *annual* earnings in 1936 of locomotive engineers were as follows: Road freight engineers (local and way freight), $3,713; road passenger engineers, $3,384; and road freight engineers (through freight), $3,017.

"The average compensation in 1936 of local and way freight conductors was $3,221; of road passenger conductors, $3,108; and of road through freight conductors, $2,730.

"The average for road firemen in local and way freight service was $2,549 and for passenger firemen was $2,500.

"The average for trainmen (other than conductors) was $1,977.

"Because of decline in the cost of living since 1929, the purchasing power of the average weekly earnings of train and engine men in the first four months of 1937 was 12.8 per cent greater than in the first four months of 1929. In other words, since 1929 they have had a substantial reduction in the number of hours they have to work for their pay and an increase of 12.8 per cent in the amount of bacon and eggs that their pay will buy; and they are now asking in addition an advance of 20 per cent over their basic pay in 1929."

The Price Extra in Railway Buying*

By Dana D. Phillips

Purchasing Department, Boston & Maine, Boston, Mass.

STARTING in the 1920's and gathering momentum, particularly through the NRA period, quantity differential lists have increased in number and complexity like a snowball rolling down hill, and the snowball is still rolling. A short time ago a letter was received from a rivet manufacturer, reading in part as follows:

"The rivet manufacturers have been working on a new list of extras applying particularly to large rivets, which will probably be put into effect April first. These changes will, of course, represent an increase."

The words "of course" were well used. Every change in extra lists for the past several years has been to increase the "extras," or to create new ones where none existed before. These extras cover price differentials for other than base sizes and base quantities.

Quantity Extras New

Several years ago, quantity extras were almost nonexistent in many of the standard steel items and consisted solely of extras for broken container quantities or the difference in freight as between carload and less carload shipments. Steel bar orders were accepted at the mill, all at base price, so far as quantity was concerned. The mills disliked to take an order for less than 1,000 lb. of one size, but would do so if we required an odd size that could not be found in local warehouses. Boiler tubes were sold at the same price, freight excepted, whether the order was for one tube or a carload. Steel sheets were all one price, for small or large orders, and although some mills expected orders in carload lots, we never had any trouble placing even a few bundles at a time with one of several mills, and these mills expressed their appreciation for the business. Many other items, such as nails, pipe, electric cable, bolts, copper ferrules and a large number of items in the non-ferrous group now have quantity extra differentials where none existed before.

Within a given length of time, the base price on bar steel increased 23 per cent, and our cost per cwt. increased 30 per cent. The major difference between these two percentages was an increase in quantity differentials.

Many railroad problems have been with us so many years that the most economical methods of approaching the problems are fairly well defined. Quantity differentials arrived so recently that we cannot follow the practices of our predecessors, but are forced to devise means to slay the dragon ourselves.

One method of increasing the size of our orders *per item* is through standardization. If we can successfully reduce the number of sizes of the various steel products which are carried in stock, such as bars, rivets, bolts, nails and sheets, we will necessarily order more of fewer sizes. Remarkable results have been accomplished by the railroads along this line without any substantial difficulty, as far as the using departments are concerned.

A method which can be employed on some items may be termed "deferred shipments." While many industries, particularly manufacturers of heavy steel products, cannot conveniently accept orders for deferred shipments, owing to the handling and storing expenses, manufac-

* From a paper awarded honorable mention in the competition held by the Purchases and Stores Division, A.A.R.

turers of the more common items will accept orders to be shipped when required. Included in this list are such items as electric cable, motor parts and carbon brushes, all of which are subject to quantity differentials. By placing large orders, we can avoid quantity extras or, at least, prices in lower "quantity extra" brackets. No investment or rehandling costs will be incurred and shipment will be made when and where required. Our only responsibility is to accept the material within some reasonable time and to watch items which may become obsolete.

Where items are used steadily in small quantities over a period of years, orders can be placed for six months' requirements at a time. Even though we are forced to accept shipments within 30 days and pay for them, we can still make a worth-while profit, provided care is exercised to place this type of order only for items which are certain to be used within a reasonable length of time. In such cases, the suggested procedure is not to order until the stock reaches a minimum and then to order six months' requirements, without reducing the order in any way because of stock on hand.

In shop order work, where a machine setup charge is involved, it is customary to make up a sufficient number of units to spread the charge as thinly as possible on each piece, the order frequently covering several months' requirements. We are accomplishing a similar purpose by purchasing ahead to avoid quantity differentials. The lower invoice price costs something in the way of investment of capital, storing expense and possible obsolescence, but we should make a profit on this operation.

An example of what may be gained by ordering six months' requirements on certain items is afforded in the case of bar steel, where the consumption averages 1,000 lb. a month. If we order every 30 days for current requirements, we will usually order about 1,000 lb. at a time. This quantity costs 75 per cent per cwt. more than the base price for this size. An order for 6,000 lb. can be placed at the base price. If we pay 3.25 cents a cwt. for 1,000 lb. lots, we will pay only 2.50 cents a cwt. for lots of 6,000 lb., or a reduction in price of 23 per cent for ordering in the 6,000-lb. quantity. Thus 23 per cent is saved, and the annual rate of interest on the investment is better than 50 per cent. Even after deducting handling and storing expense, there should still be a saving, provided, of course, the order is confined to items which will not find their way into a surplus list.

Items involving quantity extras, if used at several points, should all be cleared through one point where the extras cover the quantity shipped to one point at one time, unless each point orders in base quantities, or unless the difference in cost will not offset the expense of handling. In many cases, by properly loading a car, a carload freight rate can be obtained to one destination, a part of the shipment unloaded and the car moved to another destination.

Building crew foremen who require a few bundles of sheets at a time, drawing on stock at a central point, will eliminate large mill extras for small quantities, or high out-of-stock prices from local warehouse sources. In every case, the rehandling should not offset the saving in invoice price.

Close co-operation between the purchasing and stores and between the stores and using departments is required to control these operations. The storekeeper, always endeavoring to improve his turnover, naturally orders only the minimum amount of material needed, unless he knows what is involved in the way of higher invoice prices, so that he can match up savings against carrying and handling costs. One start toward keeping storekeepers informed is to write circular letters as each quantity extra takes effect or changes, but a more systematic method is preferable.

Published Lists Practical

This would consist of issuing loose-leaf binders to all storekeepers and then issuing quantity differential sheets, one sheet to a commodity, which can be inserted in the binder. These sheets will bear the title of the commodity and will be filed by numbers, according to A.A.R. classification. The sheet entitled "Iron-Bar" may be numbered 15-1A; "Steel-Bar" 15-2A, and "Steel-Tool" 15-3a. As quantity extras are revised, sheets marked "B" can be sent out with instructions to remove and destroy the obsolete sheets. The storekeepers can then be expected to have up-to-date sheets on file and will be furnished enough extra copies of each issue so that section men, or others interested in actually ordering material, can all have copies.

These quantity differential sheets must be made as simple and in as uniform a manner as possible, but must tell the complete story. They need not show the *price* of the item, but rather, the price differential only. A general price change, therefore, will not render a quantity differential sheet obsolete, but only a change in the actual quantity extras, which are infrequent, compared to changes in base prices.

In order to make the sheets as uniform as possible, the actual base price of an article and the largest quantity should be marked "Base," and the cost of smaller quantities can then be shown as extras per cwt. or as a percentage increase. It should also be explained whether the quantity extra applies to individual items or to the order as a whole. For example, the quantity differential sheet on steel bars may read as follows:

CLASS 15

Steel Bars—ASTM-A-107
Scope—Covers all rounds and flats up to and including 6 in. wide—Includes carbon spring steel

Quantity	Extras Per Item
6,000 lb.	—Base
Under 6,000-4,000 lb.	—0.10 cwt.
" 4,000-2,000 lb.	—0.25 cwt.
" 2,000 lb. about	—0.75 cwt.

Quantities less than 2,000 lb. per size will be purchased from warehouse if the size is carried in warehouse stock, and should therefore be ordered on a 30-day basis.

Sheet 15—2c

It will be noted that on quantities of less than 2,000 lb. the quantity extra list published by the steel mills is not shown, but, instead, the actual differential in price for the less expensive method of purchasing from warehouse stock. Such sheets carry the story of cost differences and place those who order material in full possession of the facts.

Wherever possible, the method of ordering should conform to the basis on which the material is sold. Steel bars, for example, may be ordered for stock by pounds rather than the number of bars, and enable a careful check to be kept by both the purchasing and the stores departments on the merits of the particular quantity ordered. For convenience in listing and inventory, it can also be insisted upon that the mills, in addition to showing the weights, show the number of bars of each item that are shipped, so that all the information for practical handling purposes will be available when ordering steel bars by the bar. This quantity differential list may be supplemented by information as to what items can be purchased on a deferred shipment basis, and the stores and purchasing departments will then have sufficient information to carry out any policy in handling items where quantity extras exist.

NEWS

Two New Plans For MOP Are Proposed

Stedman committee and management are reported to be near an agreement

The prospects for a consummation of the reorganization of the Missouri Pacific became considerably brighter on September 14, when the Stedman committee and the management each filed modified plans of reorganization with the Interstate Commerce Commission. The modified plans have much in common, and it is thought that at the hearing, which has been set for September 27, there will be virtual agreement between the Stedman committee and the management. The main point of difference between the two plans is the question of board control. The Stedman committee would have the bondholders control the company, while the management insists that the stockholders should have that right.

The Stedman plan would exclude the present Missouri Pacific common and preferred stockholders from any participation in the proposed new company, while the debtor company, or the management, would give them warrants to subscribe to new common stock at $25 a share for the first seven years and at $30 a share for the next eight years. Originally the plan prepared by the Stedman committee fixed a warrant price of $62.50 a share.

A second point on which the plans differ is the question of unpaid interest. The Stedman plan would recognize the unpaid interest due on the present senior mortgage bonds by the issuance of new securities for the full amount, while the debtor would recognize past due interest only to the extent that it was earned during the bankruptcy and omits any provision for the unearned interest.

Lastly, the two plans differ in that the Stedman group would place the entire control of the new board of directors in the present bondholders, while the management plans to give the present bondholders a veto on financial decisions, but would place the operating control in the present stockholders.

Neither plan discusses the sale of the terminal and industrial sites in St. Joseph and North Kansas City, Mo., to the Missouri Pacific by Terminal Shares, Inc., Alleghany Corporation subsidiary, for $21,000,000. Also equipment trust certificates of the Missouri Pacific, New Orleans, Texas & Mexico and the International Great Northern are left untouched.

G. N. Qualifies as Self-Insurer Under Motor Carrier Act

The Interstate Commerce Commission, Division 5, has approved the application of the Great Northern for authority to qualify as a self-insurer under section 215 of the Motor Carrier Act. The report points out that the applicant owns 16 pieces of equipment and "has substituted motor service over the highways for local service over the rails . . . in the states of Minnesota, North Dakota and Montana.

Domestic Air Lines Carried 120,571 Passengers in July

Nineteen scheduled air lines operating in continental United States in July, carried 120,571 passengers, and flew 50,798,434 passenger miles, according to reports to the Bureau of Air Commerce, U. S. Department of Commerce. The lines carried 611,562 lbs. of express and flew 353,318,380 express pound miles during the month. In July, 1936, the 22 lines then operating carried 111,072 passengers and 613,837 lbs. of express—operating 44,363,670 passenger miles and 299,509,562 express pound miles.

Storedoor Service at New York

Examiner A. G. Hagerty has recommended in a proposed report that the Interstate Commerce Commission dismiss the complaint wherein the Master Truckmen of America, Inc., alleged that railroads serving New York were there picking up and delivering l.c.l. freight beyond the limits defined in their tariffs—at locations above and below the street level inside buildings occupied by consignors and consignees. The examiner found the evidence insufficient to establish beyond reasonable doubt that the defendant railroads had been or were in the particulars alleged violating the Interstate Commerce Act.

Six Months' Locomotive Shipments

A total of 185 locomotives, 169 steam and 16 Diesel-electric, were shipped from the plants of the principal domestic commercial builders during the first half of the year, according to statistics compiled by the U. S. Department of Commerce. Of these, 4 steam locomotives were purchased abroad. This total compares with 27 and 102 locomotives shipped during the corresponding halves of 1936 and 1935, respectively. Unfilled orders as of June 30 totaled 372 units, made up of 325 steam, 27 electric, and 20 Diesel-electric locomotives (including 2 steam-electric units). Of these, 40 steam and one electric locotive were marked for foreign buyers.

NewHavenHearing Over to November

All new reorganization plans and amendments must be filed by October 11

All new plans and amendments to existing plans for the reorganization of the New York, New Haven & Hartford must be filed with the Interstate Commerce Commission by October 11, according to the ruling of Commissioner Charles D. Mahaffie, who last week adjourned hearings in the case until November 9. Last week's sessions, extending over two days, were devoted in the main to cross-examination of New Haven witnesses on direct testimony in support of the debtor's plan which they offered at the hearing's opening sessions in July. Also, there were statements of positions by counsel for various intervening interests; the petition of the State of Rhode Island for severance from the New Haven of the Providence & Worcester and its operation as an independent terminal system; and the plan of reorganization prepared by the Independent Bondholders Reorganization Committee.

This plan which was summarized in last week's issue struck a snag when the time came for its formal filing. Commissioner Mahaffie ruled that it would be marked for identification, and the matter of its acceptance for the record taken up with the Interstate Commerce Commission's Division 4. This ruling was based on the admission of the Independent Bondholders Reorganization Committee's counsel—Arthur Garfield Hays—that he did not represent holders of 10 per cent of any single class of securities, and thus had no statutory right to file a plan. Commissioner Mahaffie pointed out, however, that the committee as an intervenor may file a plan with the consent of the commission, and thus his suggestion that he would bring the matter before Division 4. On September 16, the Commission issued an order making the Hays plan a part of the record.

The cross-examination of Edward G. Buckland, chairman of the board, which was reported in last week's issue, was followed by that of other New Haven witnesses, including F. J. Wall, vice-president; H. W. Dorigan, executive assistant to the trustees, and G. T. Carmichael, comptroller. Mr. Wall was asked only a couple of questions on the study of traffic and revenue prospects which he had introduced at the July sessions. Counsel for

(*Continued on page 388*)

Will Argue Motor Hours on Oct. 19

Railway labor's exceptions to report assailed in replies by two A. T. A.'s

The Interstate Commerce Commission has set October 19 as the date for oral arguments before Division 5 at Washington, D. C., on Examiner R. W. Snow's proposed report on hours of service regulations for motor carriers. The Snow report, which was outlined in the *Railway Age* of July 24, sanctioned the sleeper cabs and recommended flexible rules, providing as maxima a 60-hr. week or not more than 70 hrs. in any period of eight consecutive days, with limits of 15 hrs. "on duty" and 12 hrs. "at work" in any period of 24 consecutive hrs.

Meanwhile, following several briefs of exceptions to the examiner's report, there have been filed with the commission the American Trucking Associations and the American Transit Association briefs of exceptions to exceptions. The latter deal, among others, with the brief of the four railroad train service brotherhoods, which was abstracted in the *Railway Age* of September 4.

Before getting down to its individual replies to the exceptions of the railroad brotherhoods and others, American Trucking Associations makes some general remarks among which it notes that the Snow report has brought forth "a very small number of exceptions representing a smaller number of interests and a still smaller interest in facts as distinguished from motives." This situation, which is interpreted as a disposition of the American public "to rest its interests on the examiner's proposed report," is called "a glowing tribute to the commission."

Then comes a roll call of the protestants wherein the listing of the railroad brotherhoods is followed by the observation that "Their 'solicitude' for the welfare of the trucking industry and the conflict of interest is so well known that the source is but to be noted."

The specific reply to the brotherhoods notes that the latter's brief said it had been prepared without a copy of the record. But, A. T. A. continues, the brotherhoods' interests in the matter "are so opposed to the trucking industry and to employees of the trucking industry that the mere lack of record or attendance at all of the hearings probably didn't make any difference."

Truck drivers, it is pointed out are not members of the Brotherhood of Railroad Trainmen; and "the only trainmen that testified during the entire hearing were men whom truck operators had employed when the railroad laid them off and they testified that driving a truck was no harder than driving an engine . . . and they kept their truck driving job when they had a chance to go back on an engine."

Referring to the sleeper cab the A. T. A. notes that the 60-hr. week limitation proposed is only about 35 per cent of the total weekly hours, and adds that "it is bordering on the ridiculous to suggest that under these circumstances, the use of the sleeper cab would result in men being away from home weeks at a time." Turning to the brotherhoods' exceptions to proposals relating the hours on duty and working hours, the reply asserts that the railway unions offered no testimony during the hearings; and that such unions do not represent the interests of the trucking industry or its employees. "They represent the interests of labor organizations which are competitive with truck drivers. If they can drive the trucking employees out of their jobs they create more jobs for the members of the railroad unions."

The brotherhoods are next said to have "the audacity to take exceptions to the regulations proposed by the examiner when in their own house they have never, so far as we know, complained to either congress or the commission that the 16-hr. law for trainmen was unsafe. The commission will notice that the railroad unions appeared before the Black-Connery wage-hour committee and demanded that they be excepted. . . . The trainmen desire short working hours and long sleeping hours for the truck operator but want to reserve for trainmen the privilege of working overtime."

The Transit Association calls "most unusual to say the least" the admission of the brotherhoods that their brief was prepared without a copy of the record in hand. It goes on to assert that "counsel for the brotherhoods did not participate in several of the hearings . . . and did not present a witness of any kind at any of the hearings"; and there is not in the record "one syllable of testimony" with regard to the brotherhoods' views. Statements which brotherhood counsel did make "at one or two hearings" are dismissed as being "entirely unsupported by testimony."

With the record thus silent with reference to matters other than the relation of hours of service to safety of operation, the Transit Association asks, "How could the examiner and how can the commission consider other factors?" The record is said to be "full of 'opinion evidence'" on the relation of long hours to safe driving; a "minor part" of this was introduced by labor unions, "but none by the brotherhoods." Most of this labor testimony urged a 48-hr. week, but "more 'opinion evidence' was introduced by carriers urging work days and work weeks longer than recommended in the examiner's report." And, the Association thinks it should be noted that "the only extensive records of accidents in relation to hours of driving were introduced by the carriers, and they prove conclusively that hours as long as those prescribed by the examiner in his report are not productive of unsafe operation."

R. F. C. Loans to Railroads

The balance sheet of the Reconstruction Finance Corporation as of August 31, shows disbursements to railroads (including receivers) of $532,126,239 and repayments of $180,271,228.

Mechanical Men to Meet Jointly

Four Mechanical Associations to hold conventions September 28 to October 1

Comprising the first occasion on which the specialized mechanical groups are to hold their annual conventions simultaneously, the annual meetings of the Master Boiler Makers' Association, the Car Department Officers' Association, the International Railway General Foremen's Association, and the Railway Fuel & Traveling Engineers' Association will convene from September 28 to October 1 at the Hotel Sherman, Chicago. In conjunction with these meetings the Allied Railway Supply Association will sponsor a combined exhibit of railway mechanical equipment and supplies, in which about 100 companies have already arranged to participate.

The Allied Railway Supply Association was organized at Chicago in May, 1935, for the purpose of unifying the exhibit work of the supply groups connected with the following railroad associations: Traveling Engineers' Association, Air Brake Association, International Railway General Foremen's Association, Master Boiler Makers' Association, International Railway Fuel Association, Railroad Master Blacksmiths' Association, and the Car Department Officers' Association. The present officers of the allied group are: President, E. S. Fitzsimmons, Flannery Bolt Company, Bridgeville, Pa.; first vice-president, L. B. Rhodes, Vapor Car Heating Company, Washington, D. C.; second vice-president, J. W. Fogg, MacLean-Fogg Lock Nut Company, Chicago; third vice-president, C. F. Weil, American Brake Shoe & Foundry Company, Chicago; fourth vice-president and treasurer, F. W. Venton, Crane Company, Chicago; fifth vice-president, M. K. Tate, Lima Locomotive Works, Inc., Lima, Ohio; sixth vice-president, H. S. Mann, Standard Stoker Company, Inc., Chicago; secretary, J. F. Gettrust, Ashton Valve Company, Chicago.

The Master Boiler Makers' Association will hold a two-day convention on September 29 and 30. The program is set as follows:

TUESDAY, SEPTEMBER 28

Registration of Members and Guests.

WEDNESDAY, SEPTEMBER 29

Morning Session

Registration.
Business session.
Meeting called to order at 10.00 a. m.
Annual address by President M. V. Milton.
Routine Business.
Address by D. C. Buell, director, Railway Educational Bureau, Omaha, Neb.
Annual report of the secretary-treasurer.
Miscellaneous business.
New business.
Appointment of special committees to serve during meeting.
Memorials.
Announcements.
Topic No. 7. Topics for 1938 Meeting. George M. Wilson, Chairman.

Afternoon Session

Registration.
Meeting called to order at 2:00 p. m.
Committee report on topical subjects.

Topic No. 1. Pitting and Corrosion of Locomotive Boilers and Tenders. Louis R. Haase, district boiler inspector, Baltimore & Ohio, chairman.
A representative of the Water Service Committee of the American Railway Engineering Association will discuss the report.
Topic No. 5. Improvements to Prevent Cracking of Firebox Sheets Out of Staybolt Holes. C. W. Buffington, general master boiler maker, Chesapeake & Ohio, chairman.
Topic No. 8. Law.—Myron C. France, general boiler foreman, Chicago, St. Paul, Minneapolis & Omaha, chairman.
Announcements.

THURSDAY, SEPTEMBER 30
Morning Session

Registration.
Meeting called to order at 9:00 a. m.
Unfinished business.
Annual address by Secretary-Treasurer Albert F. Stiglmeier.
Address by Col. C. C. Stibbard, chief operating officer, Board of Railway Commissioners, Ottawa, Ont.
Topic No. 2. Autogenous Welding and Cutting as Used with the Fabrication of Boilers and Tenders.
Albert F. Stiglmeier, foreman, boiler department, New York Central West Albany Shops, chairman.
In the discussion of the report a special paper will be presented by the Welding Section of the National Electrical Manufacturers Association on Code Requirements for Welded Seams; one by the International Acetylene Association on Heat Effects on Sheets When Cut by the Acetylene Process; another from the Lincoln Electric Company on What the Development of Coated Electrodes Has Done for the Railroads; and one from the Lukens Steel Company on Heat Effects on Welded Sheets.
Topic No. 3. Proper Thickness of Front Tube Sheets.
Announcements.

Afternoon Session

Registration.
Meeting called to order at 2:00 p. m.
Announcements.
Topic No. 4. Improvements in Safe Ending and Application of Flues and Tubes. Frank A. Longo, welding and boiler supervisor, Southern Pacific, chairman.
Topic No. 6. What Is Being Done to Prevent Back Tube Sheets from Cracking in Radius of Flange and Out of Tube Holes. Louis Nicholas, general boiler foreman, Chicago, Indianapolis & Louisville, chairman.
Report of chairman of Executive Board.
Election of officers.
For the good of the association.
Adjournment.

Its officers are: President, M. V. Milton, chief boiler inspector, Central region, Canadian National; secretary-treasurer, A. F. Stiglmeier, general boiler department foreman, New York Central, Albany, N. Y.

The Car Department Officers' Association will hold a two-day meeting on September 28 and 29, the program for which has been set as follows:

TUESDAY, SEPTEMBER 28
Morning Session

Address by President K. F. Nystrom, superintendent car department, Chicago, Milwaukee, St. Paul & Pacific.
Address by a representative of the Association of American Railroads.
Address by Roy V. Wright, editor, Railway Mechanical Engineer.
Report of Auditing Committee.
Report of Secretary.
Report on Constitution and By-Laws.
Election of Officers.

Afternoon Session

Address by C. J. Nelson, superintendent interchange, Chicago Car Interchange Bureau.
Address by W. L. Ennis, manager refrigeration and freight claim prevention, Chicago, Milwaukee, St. Paul & Pacific.

WEDNESDAY, SEPTEMBER 29
Morning Session

Address by J. T. Gillick, chief operating officer, Chicago, Milwaukee, St. Paul & Pacific.
Address by LeRoy Kramer, vice-president, General American Transportation Corporation.
Address by A. F. Stuebing, railway mechanical engineer, United States Steel Corporation.

Afternoon Session

Address by W. J. Patterson, chief, Bureau of Safety, Interstate Commerce Commission.
Discussion of A.A.R. Rules, led by M. E. Fitzgerald, chief car inspector, Chicago & Eastern Illinois.

K. F. Nystrom, superintendent car department, Milwaukee, St. Paul & Pacific, Milwaukee, Wis., is president of the association, and Frank Kartheiser, chief clerk to the mechanical assistant to the executive vice-president, Chicago, Burlington & Quincy, was appointed acting secretary upon the retirement of Adam Steinberg in June, 1935.

The Railway Fuel & Traveling Engineers' Association, newly created by merger of the Traveling Engineers' Association and the International Railway Fuel Association, will hold its first annual convention from September 28 to October 1. The program has been planned as follows:

TUESDAY, SEPTEMBER 28—GENERAL SESSION
Morning Session

Convention called to order at 10.30 a. m.
Chairman's address by J. D. Clark, fuel supervisor, Chesapeake & Ohio.
Address by M. J. Gormley, executive assistant to president, Association of American Railroads.

Afternoon Session

Report on Fuel Records and Statistics, by E. E. Ramey, fuel engineer, Baltimore & Ohio.
Address by Roy V. Wright, editor, Railway Mechanical Engineer.

WEDNESDAY, SEPTEMBER 29—MECHANICAL DAY
Morning Session

Report on New Locomotive Economy Devices, by A. G. Hoppe, assistant mechanical engineer, Chicago, Milwaukee, St. Paul & Pacific.
Report on Steam Turbine and Steam Condensing Locomotives, by L. P. Michael, chief mechanical engineer, Chicago & North Western.
Address by W. H. Flynn, general superintendent motive power and rolling stock, New York Central.
Report on Front Ends, Grates and Ashpans, by Prof. E. C. Schmidt, University of Illinois.

Afternoon Session

Report on Attention to Valve Motion and Its Effect on Fuel Economy, by M. F. Brown, fuel supervisor, Northern Pacific.
Report on Utilization of Locomotives, by A. A. Raymond, supervisor of fuel and locomotive performance, New York Central.

THURSDAY, SEPTEMBER 30—AIR BRAKE DAY
Morning Session

Report on Air Brakes, by W. H. Davies, superintendent air brakes, Wabash.
Address by L. K. Sillcox, first vice-president, New York Air Brake Company.

Afternoon Session

Report on Locomotive Firing Practice—Oil, by R. S. Twogood, assistant engineer, Southern Pacific.
Report on Locomotive Firing Practice—Coal, by W. C. Shove, general fuel supervisor, New York, New Haven & Hartford.

J. D. Clark, fuel supervisor of the Chesapeake & Ohio, Richmond, Va., is chairman of the combined association and T. D. Smith is its secretary-treasurer.

The International Railway General Foremen's Association will hold its annual convention on September 28 and 29, the program of which follows:

TUESDAY, SEPTEMBER 28
Morning Session

Opening Ceremonies.
Opening Address. How Can the Mechanical Supervisor be of Greater Assistance to the Railroad Management, by R. E. Woodruff, vice-president, Erie Railroad.
How Long Can We Put Off Training Men—Locomotive and Car Department Mechanics—Supervisors, by H. J. Schulthess, chief of personnel, Denver & Rio Grande Western.
Discussion.

Afternoon Session

Mechanical Supervisors and Public Opinion, by Roy V. Wright, editor, Railway Mechanical Engineer.
Modern Methods in Freight Car Building and Repair, by J. E. Echols, foreman freight car repair shop, Norfolk & Western.
Freight Car Repairs at Keyser Valley, D. L. & W. Railroad, by J. Thompson, general foreman, car department, Delaware, Lackawanna & Western.
Discussion.

WEDNESDAY, SEPTEMBER 29
Morning Session

Open Forum. A three-hour roundtable discussion of subjects presented by members pertinent to locomotive back shops, enginehouse and passenger and freight car problems.
What to Teach About Safety.
Improving Work Methods.
Controlling Wastes.
Does Low Stock Inventory Pay?
Winning Co-operation.
Material Reclamation.
Maintenance of Special Equipment Applied to Locomotives.
Maintenance of Freight Equipment.
Care and Maintenance of Shop Tools.
Need for Trained Mechanics, Touching on Apprentices.

Afternoon Session

Can Modern Machine Tools Cut Repair Costs, by L. H. Scheifele, tool and material inspector, Reading Company.
Handling Unsafe Practices About Locomotive and Car Shops, Enginehouses and Repair Yards, by R. C. Helwig, safety agent, Delaware & Hudson.
Discussion.

FRIDAY, OCTOBER 1—FUEL DAY
Morning Session

Report of Subjects Committee.
Report on Inspection, Preparation and Utilization of Coal, by W. R. Sugg, superintendent fuel conservation, Missouri Pacific.
Address by Eugene McAuliffe, president, Union Pacific Coal Company.
Report of Secretary-Treasurer T. Duff Smith.
Report of Finance Committee.
Report on Constitution and By-Laws.
Election of Officers.

The president of the association is T. T. James, general foreman, motive power department, Delaware, Lackawanna & Western, Kingsland, N. J. As yet no secretary-treasurer has been named to succeed William Hall, retired.

Railroad Employment in August

Class I railways, excluding switching and terminal companies, had 1,162,797 employees in August, an increase of 6.6 per cent over August, 1936, but a decrease of .9 per cent under July, according to the Interstate Commerce Commission's compilation based on preliminary reports. The index number for August, based on the 1923-1925 average as 100, stood at 65.1.

Enthusiasts Activities

The September meeting of Railroad Enthusiasts, Inc., New York division, will be held on September 24 in Room 2726, Grand Central Terminal, New York City. A. P. Formanek, a member of the club, will describe his experiences in travel on European carriers during the past summer, accompanied by moving pictures of French and British trains.

Malay Rubber Import Shipments Must Travel by Rail

All rubber imports from Siam into the Federated Malay States must be shipped on the state railway system, according to a recent decree. Enacted for the alleged purpose of controlling smuggling of the product, the new act will effect complete loss of this trade by highway carriers, which have been carrying about 650 tons of imported rubber per month.

B. & O. and Virginian Name Men for Coal Research Group

H. W. Walker, coal development engineer with the Virginian at Norfolk, Va., and W. H. Tapman, general mechanical inspector, test department, Baltimore &

Ohio, have been appointed to represent their respective roads on the technical committee, coal research laboratory of the Carnegie Institute of Technology, Pittsburgh, Pa.

Strike Ended on Steel Road

Train service employees of the Conemaugh & Black Lick, a short line subsidiary of the Bethlehem Steel Corporation at Johnstown, Pa., who went on strike last June by direction of the Brotherhood of Railroad Trainmen and the Brotherhood of Locomotive Firemen & Enginemen, returned to work on September 14. The company announced that full seniority rights have been restored.

Club Meetings

The regular Fall meeting of the Eastern Association of Car Service Officers will convene on September 30 at the Hotel McAlpin, New York City. The program will include discussion, on subjects to be chosen later, and the election of officers for the ensuing year.

The Railway Club of Pittsburgh, Pa., will hold its next meeting on September 23 in the Hotel Fort Pitt, Pittsburgh. The program features a paper entitled "Progress in Track Maintenance to Meet Requirements of Present Day Traffic," to be presented by Robert Faries, assistant chief engineer of maintenance, Pennsylvania, Philadelphia, Pa.

Railway Labor Unions Oppose Acquisition of RIAL

Severely criticizing the labor policies on the Couch-operated Louisiana & Arkansas, the Railway Labor Executives Association and 18 railway labor unions have intervened in the matter of the application of the L. & A. to acquire the properties of the Rock Island, Arkansas & Louisiana. The brief of the labor organizations charges that the working conditions and wages on the RIAL are more satisfactory than on the L. & A. and points out that while the Rock Island is a party to the dismissal wage agreement, the L. & A. is not. Also the brief says that all classes of employees of the Rock Island are represented in labor organizations, but that this is not true of employees on the L. & A.

The brief also alleges that consolidation of shops of the L. & A. and the RIAL would result in 60 men being thrown out of work. The unions contend that the proposed acquisition would not be in the public interest and would not further the commission's plan of consolidation.

At an earlier hearing the representatives of certain labor unions testified that the L. & A. had been the cause of numerous labor controversies by refusing to abide by the awards of arbitration boards.

French Lines Offer Vacation Rates

Taking advantage of recent labor legislation providing for yearly vacations with pay to most commercial and industrial employees, the French railways are publishing a special round-trip vacation rate granting a reduction of 40 per cent from regular fares. The special rates are offered in the effort to build up a passenger traffic field heretofore relatively unknown in France. Coupled with the new fare tariffs, is the extended operation of special trains to week-end resorts and circle tours designed to acquaint the urban worker with the beauties of his country.

Live Stock Law Held to Apply Only to Deliberate Negligence

The Fifth Circuit Court of Appeals, United States v. Illinois Central, 90 F. (2d.) 213, affirming judgment for the defendant in the Federal District Court for eastern Louisiana, held that the confinement of cattle for more than 36 hours through the negligent oversight of a yardmaster was not a violation of the Cruelty to Animals Act prohibiting such confinement "knowingly or willfully." Several previous decisions, the court pointed out, take the view that an absolute duty is imposed by the act except in cases of storm, accident, or unavoidable causes. The majority of the decisions construing the act, however, hold that "willfully" means with deliberate and conscious purpose, and not through unintentional oversight or simple negligence.

Chicago's "Transportation Week" Set for September 20-25

September 20-25 has been designated Transportation Week by the Traffic Club of Chicago, and during these six days a display of photographs, exhibits, models and actual equipment at the club headquarters will portray the evolution in transportation. At a luncheon on September 24 the evolution and future of transportation agencies will be discussed by representatives of various branches of transportation. The speakers include H. G. Taylor, chairman of the Western Association of Railway Executives, for the railways; W. W. Huggett, vice-president and general manager of the North Pier Terminal Company, for the waterways; Major Roy Britton, director of the National Highway Users Conference, for commercial motor transport; and C. R. Smith, president of the American Air Lines, for the airways. As an added attraction, a special program will be provided on each of the first four days by each form of transportation, airways being scheduled for September 20, highways September 21, railways September 22 and waterways September 23.

Complaint Against Greyhound

The Southeastern Bus Tariff Bureau, which describes itself as "a non-profit association composed of 19 common carriers by motor vehicle," has filed with the Interstate Commerce Commission a complaint against the alleged refusal of various units of the Greyhound System to join in through routes and joint rates with the complainant's member bus lines. The complaint, which asserts that Greyhound intra-system traffic agreements "tend to create a monopoly and are injurious to the public interest," asks among other things an I.C.C. investigation and orders requiring the Greyhound to join in through routes and joint rates.

Greyhound units named are the Atlantic Greyhound Corporation, the Ohio Greyhound Lines, the Central Greyhound Lines, the Pennsylvania Greyhound Lines, and the Southeastern Greyhound Lines.

Fourth-Section Relief

The Interstate Commerce Commission has modified and amended previous fourth-section orders granting relief in connection with class and commodity rates between California ports and inland points beyond and Washington and Oregon ports and inland points beyond, and between northern and southern California ports. The modifications authorize on explosives a minimum weight of not less than 20,000 lb. in connection with rates not lower than 25 cents per 100 lb. higher than corresponding rates by water; exclude relief in connection with shipments in tank cars; and authorize relief over the Southern Pacific-Portland Electric route through Portland, Ore.

Other recent fourth-section orders authorize relief on anthracite coal from points in Pennsylvania to Harlem River, N. Y., and modify previous orders so as to authorize during the period of navigation each year relief in connection with rates on newsprint paper from points in Maine and the Province of Quebec to Philadelphia, Pa.

Roads Sign World's Fair Contract

L. G. Coleman, representing the Eastern Presidents Conference Committee, and Grover Whalen, head of the New York World's Fair, on September 15, signed a contract whereby the Eastern roads have arranged for 15½ acres of exhibit space at the exposition, to be held in 1939, for a display of railway accomplishments, methods and service.

The contract stipulates a space rental amounting to $97,438. Bonds to the extent of $1,456,000 have already been subscribed for by the carriers.

According to present plans, the history of railroading from early days to the present will be presented through the medium of a 4,000-foot track exhibit and a building covering 110,000 square feet of floor space. For spectators an open-air grandstand seating 4,000 persons will be set up.

L. G. Coleman is director of the project, and J. M. Davis, president of the Delaware, Lackawanna & Western, is chairman of the World's Fair Committee.

A display of equipment and accessories has been placed in the hands of a special railroad equipment and supply industries committee, under the chairmanship of W. L. Conwell, president of the Safety Car Heating & Lighting Company.

Previous reports on the railroad committee in charge and early plans appeared in the *Railway Age* for May 29 and June 5.

Canadian Roads Ask Truck Control

In a bulletin entitled "Highway Transportation," the Railway Association of Canada presents a plea for more adequate regulation of motor transport in the Dominion. Citing eminent authorities as to the essential nature of rail transportation to the nation, the bulletin asserts that in 1935 the Canadian railways lost $38,000,000 of freight revenue—or 16 per cent of

the total—to their highway competitors. This loss is ascribed, not to superior efficiency of the motor carriers, but to their ability to pick and choose their traffic and to refuse to give service unless it can be provided at a profit.

The bulletin also cites, by provinces, inadequate taxation of commercial motor vehicles, showing the disproportionate tax load on private pleasure cars. Taxes on these latter run from slightly under 3 mills to more than 4 mills per ton-mile, while levies per ton-mile on trucks range upward only to a little more than 2 mills per ton-mile and downward to less than 1½ mills.

Trans-Missouri-Kansas Advisory Board Meeting

The 49th regular meeting of the Trans-Missouri-Kansas Shippers' Board will be held at St. Louis, Mo., on September 21. The program provides for a discussion of Live Load and Dead Weight as a Factor in Operating Costs, by W. H. Mussey, research and development engineer of the Pullman Railroad, O. Jabelmann, assistant general superintendent of motive power of the Union Pacific and E. J. Jumper, general mechanical engineer of the Union Pacific; a resume of the Wheat Movement During the Peak Loading, by E. W. Coughlin, district manager of the car service division of the A. A. R.; and an address on Truck and Rail Progress as to Co-operation, by J. H. Tedrow, traffic commissioner of the Chamber of Commerce of Kansas City, Mo. At a joint luncheon with the St. Louis Traffic Club an address will be made by Robert S. Henry, assistant to the president of the Association of American Railroads.

Swiss Celebrate Rail Travel at Baden Festival

Outlining the history of travel to and from Baden, the famous Swiss health resort, from the Roman chariot transport era to the opening of the Zurich-Baden railway route in 1847, a procession of costumed parties, carriages, and old railway rolling stock progressed through the streets on August 8 and 15 as part of a week's festivities to celebrate the antiquity of the town and the 90th anniversary of the opening of the Zurich-Baden line, according to the Railway Gazette (London). Last in the line of march was a full-sized facsimile of the No. 2 locomotive of the railway, which, while mounted on a road chassis and powered by a tractor engine, emitted real smoke and steam.

At the Baden station, the Swiss Federal Railways offered a track exhibit including the oldest existing Swiss locomotive, No. 15, originally built in 1857, and reconditioned and provided with a cab in 1880, a third-class coach built in 1856, and an early box car of the system.

Total Operating Revenues Up 1.3 Per Cent

Preliminary reports from 91 Class I railroads, representing 78.8 per cent of total operating revenues, show that those roads, in August, 1937, had estimated operating revenues amounting to $279,793,028 compared with $276,180,210 in the same month of 1936 and $366,827,476 in the same month of 1930, according to an announcement by the Association of American Railroads. Operating revenues of those roads in August, 1937, were 1.3 per cent above those for August, 1936, but 23.7 per cent below August, 1930.

Freight revenues of the 91 Class I railroads in August, 1937, amounted to $223,584,572 compared with $222,387,326 in August, 1936, and $278,704,948 in August, 1930. Freight revenues in August, were five-tenths of one per cent above the same month of 1936, but 19.8 per cent below the same month in 1930.

Passenger revenues in August, 1937, according to these preliminary reports from 91 Class I railroads, totaled $33,308,974 compared with $31,401,914 in August, 1936, and $55,143,857 in August, 1930. For the month of August, they were 6.1 per cent above the same month of 1936, but 39.6 per cent below the same month in 1930.

I. C. C. Permits Santa Fe Bus Line Purchase

The Interstate Commerce Commission has entered an order authorizing the purchase by the Santa Fe Trail Transportation Company, highway affiliate of the Atchison, Topeka & Santa Fe, of the Silver Star Stages, a bus line operating between Pittsburg, Kan., and Parsons, 36 mi. The order is accompanied by Division 5's supplemental report on the case, a prior report having deferred action to give the St. Louis-San Francisco, "an opportunity to demonstrate its willingness and ability to improve its present passenger train service between Pittsburg and Parsons, or to establish supplementary bus service."

The supplemental report states that the commission has been advised by the Frisco of the authorization received from the Kansas commission to discontinue the Pittsburg-Parsons train service; and of the Frisco's disposition to interpose no objection to the granting of the Santa Fe Trail's application.

Drought-Relief Rates

The Interstate Commerce Commission has authorized the Northern Pacific and the Chicago, Milwaukee, St. Paul & Pacific to establish reduced rates on hay, feed and other forages from points on their respective lines in Iowa, Minnesota, Montana, North Dakota, South Dakota and Wisconsin to specified drought-stricken areas in Montana and North Dakota. Also, an amendment to a previous drought order permits these roads to establish reduced rates for the transportation of live stock from the same drought-stricken areas of Montana and North Dakota to available feeding lots in Minnesota, Montana, North Dakota and South Dakota.

Another similar relief-rates order permits the Minneapolis, St. Paul & Sault Ste. Marie to extend previously-authorized reduced rates on hay, feed and other forages to additional drought-stricken points in North Dakota.

Retirement of Leased Equipment Held Deductible from Income

Holding that the retirement value of leased rolling stock entitles a like deduction from the income statement of the lessor road, the Seventh Circuit Court of Appeals recently reversed a decision of the federal Board of Tax Appeals determining a deficiency in the income tax imposed upon the Yazoo & Mississippi Valley, a subsidiary of the Illinois Central, by the Commission of Internal Revenue. In 1926 the road leased the properties of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific for 999 years, agreeing to retire rolling stock and equipment as it became damaged or obsolete, replacing it with property of equal value. The value of the replacements of leased equipment made by the lessee during the first five years of the lease was agreed to be $1,161,987. Upon petition of Illinois Central in regard to tax refunds of its subsidiary, requesting review of the adverse decision of federal Board of Tax Appeals, the court held that the petitioners, in determining their income tax, were entitled to deduct from their income in each year, as "ordinary and necessary expenses," the aggregate value of the equipment units retired during each year, as accrued upon the books of the lessee company.

Alleghany Advisory Board to Meet

The regular Fall meeting of the Alleghany Shippers Regional Advisory Board will be held on September 23, at 9:30 a. m., at the Hotel Roosevelt, Pittsburgh, Pa. At that time regular committee reports covering the board's activities for the last three months will be presented, including the legislative committee report to be presented by J. B. Keeler, assistant general traffic manager of the Koppers Company. This will be followed by an open forum discussion on the work of the Trunk Line Inspection Bureau, to be presented by J. W. Edwards.

A synopsis concerning the national situation in car supply and prospective car loadings will be given by W. J. McGarry, of the Car Service Division, A.A.R. The guest speaker on the program is Dr. C. S. Duncan, consulting economist for the A.A.R., who will address the luncheon session on the subject "The Outlook of Future Business."

Electrical Group to Become Section of A.A.R. Division

The 26th annual convention of the Association of Railway Electrical Engineers, to be held on October 27 and 28, at the Hotel Sherman, Chicago, will mark the amalgamation of the association with the Mechanical division of the Association of American Railroads, as the electrical section thereof. The consolidation is the fruition of plans under discussion for a number of years, ending in approval for the move by the board of directors of the A.A.R. at its meeting on June 30. It is felt that amalgamation will result in expanding the membership and scope of the present organization, thereby making it more important and useful to the carriers.

The question of consolidation was first broached at the 11th annual convention of the electrical association, held in Chicago in 1919, at which time the association voted in favor of such amalgamation, and directed the executive committee to nego-

tiate and consummate this arrangement. Considerable work was done in regard to this matter and the association was later voted in as the electrical section of the mechanical division. Consolidation was not put into effect at that time, however, but was held in abeyance by R. H. Aishton, then president of the American Railway Association, A.A.R. predecessor. The subject was again opened up by the A.A.R. on April 5, 1937, and the consolidation approved by the board of directors on June 30, 1937.

Freight Car Loading

Revenue freight car loading, for the week ending September 4, totaled 804,633 cars, an increase of 17,260 cars or 2.2 per cent above the preceding week, an increase of 39,502 cars or 5.2 per cent above the corresponding week in 1936, and an increase of 212,692 cars or 35.9 per cent above the corresponding week in 1935. All commodity classifications except grain, forest products and ore showed increases over the preceding week, while all commodity classifications except livestock showed increases over last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, September 4

Districts	1937	1936	1935
Eastern	157,151	155,919	115,824
Allegheny	160,407	155,309	107,384
Pocahontas	54,063	53,360	43,289
Southern	105,887	104,834	85,650
Northwestern ..	141,105	122,103	99,618
Central Western	122,712	112,968	92,537
Southwestern ..	63,308	60,638	47,639
Total Western Districts	327,125	295,709	239,794
Total All Roads	804,633	765,131	591,941
Commodities			
Grain and Grain Products	38,101	32,662	36,649
Live Stock	14,582	16,952	15,095
Coal	134,917	130,167	110,646
Coke	10,252	9,796	5,947
Forest Products	37,498	34,344	26,877
Ore	72,388	56,098	31,840
Merchandise L.C.L.	172,258	172,182	139,972
Miscellaneous .	324,637	312,930	224,915
September 4 ...	804,633	765,131	591,941
August 28	787,373	754,097	680,848
August 21	781,247	735,476	625,774
August 14	777,382	736,578	614,005
August 7	769,706	728,371	582,077
Cumulative Total, 36 Weeks ...	29,660,535	23,876,296	21,075,543

In Canada.—Car loadings for the week ended September 4 totaled 60,861 cars, as against 57,245 for the previous week and 55,641 for the corresponding week last year, according to the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
September 4, 1937.....	60,861	22,489
August 28, 1937.....	57,245	22,153
August 21, 1937.....	54,761	22,468
August 29, 1936.....	55,641	21,078
Cumulative Totals for Canada:		
September 4, 1937.....	1,707,157	940,643
August 29, 1936.....	1,558,105	805,012
August 31, 1935.....	1,505,891	744,787

Egyptian System Pushes Low-Cost Travel Program

The sale of railway travel in mileage "blocks," at reduced rates, and cheap all-expense special excursions to historical spots, with sleeping-car accommodations, are the most recent examples of a campaign to encourage passenger traffic sponsored by the Egyptian State Railways. According to a pamphlet describing the services, the system now offers for sale "blocks" of travel in three distance groups totaling two, five and ten thousand kilometers, respectively. Comparable to the script mileage tickets, these travel blocks provide for a reduction below regular rates of 35 to 40 per cent. There are also offered round-trip tickets to the historical sections of upper Egypt, which include rail fare, sleeping car charges, hotel accommodations and local cab transportation, issued by the state railways in conjunction with the International Sleeping Car Company and the Upper Egypt Hotels Company.

Far less expensive and offering the most mileage for the fare of any of the system's tours is the "antiquities" train, which is operated on a 700-mile round-trip run between Cairo and Luxor, providing an overnight journey each way, and a stop of two days and one night at Luxor. The ten dollar fare charged for the round trip covers sleeping accommodations and individual seats for the entire trip. The cars serve as sleeping headquarters during the two-day stop-over at Luxor.

S. P. Streamliners Go in Service September 19

Two eight-car streamlined trains, recently completed by the Pullman-Standard Car Manufacturing Company for the Southern Pacific, will be placed in service on September 19 between Houston, Tex., and Dallas on a non-stop schedule of 4 hr. 45 min. for the 263.7 miles. Train number 13 will leave Houston at 4 p.m. and will arrive in Dallas at 8:45 p.m., while number 14 will leave Dallas at 4:15 p.m. and arrive in Houston at 9 p.m. Each train, which will resemble the "Daylight," the S. P.'s streamlined train between San Francisco and Los Angeles, in outward appearance, will consist of a streamlined steam locomotive, a baggage car, a combination dining, lounge and observation car and five coaches.

All seats on this train, as those on the Daylight, will be reserved. Special attention will be paid women patrons, ticket sellers being instructed to determine whether the single party traveling is man or woman and to assign women traveling alone or with children to the two chair cars having women's lounges. They are also instructed to use seats next to windows first in assigning, to reserve one chair car for colored patrons and not to assign seats facing backward unless all others have been assigned, and when necessary to use these seats to call the passenger's attention to the fact that they face backward. Conductors are instructed to have available necessary forms so that passengers holding coach tickets may transfer en route to first class service with facility.

The new trains will be known as the "Sunbeam," taking the name from present trains, which will be renamed the "Hustler." The latter will operate on a schedule of 5 hr., or 1 hr. 55 min. faster than as at present. It will leave Houston at 9 a.m. instead of 11:25 a.m., and will arrive in Dallas at 3 p.m. instead of 5:55 p.m., while returning it will leave Dallas at 9:45 a.m. instead of 12:35 p.m., and will arrive in Houston at 3:45 p.m. instead of 7:05 p.m.

New Zealand Staff Book Summarizes Recent Transport Regulation

The 13th annual issue of the railway service handbook of the New Zealand Government Railways contains a digest of developments in motor transport regulation in New Zealand during 1936, by R. Simple, minister of transport. After describing briefly the standardization and revision of safety regulation, the report lists the provisions of the licensing amendment of 1936. The most significant of these are the application of standard maximum hours for motor vehicle drivers under the Transport Act, the control of the earnings of "owner-drivers," and the establishment of a "30-mile restriction" to prevent the possibility of long-haul competition with the railways through the recent extension of local service areas. Restriction of such competition has been within the jurisdiction of the Ministry of Transport for some time and the "30-mile restriction" has been created to protect that jurisdiction.

The railway handbook, published annually since 1924, is a 305-page book, compiled for the information of all employees of the dominion's railway system. In addition to the annual messages of the minister of railways, the minister of transport, and the general manager of the railways, it contains a complete reprint of staff and apprentice regulations under the Government Railway Act, a section devoted to operating rules, a full table of wage-scales, accident liability, sick benefits, holidays, etc., a skeleton table of freight tariff charges, and reprints of recent labor legislation. General information pertaining to stations, telephones, locomotive classification and other pertinent facts about the system are also included.

P. R. R. Awards Scholarships

Award has been made of three college scholarships offered annually to sons of Pennsylvania employees. The successful competitors have arranged to matriculate for the academic terms beginning this month.

The Frank Thomson scholarships, two in number, have been awarded to A. B. Stewart, of Philadelphia, Pa., and J. J. Skelly, Jr., of Queens Village, N. Y. Mr. Stewart is the son of George H. Stewart, civil engineer, maintenance of way department, Philadelphia terminal division, and will attend Antioch College. Mr. Skelly is the son of J. J. Skelly, inspector, electrical engineer's office, New York, and is enrolled in the Massachusetts Institute of Technology.

The John Clark Sims Memorial Scholarship has been awarded to Robert Burton Turner, of Norwood, Pa., son of Clarence L. Turner, head clerk, chief engineer's office, Philadelphia, who has arranged to attend the University of Pennsylvania.

The Frank Thomson scholarships, valued

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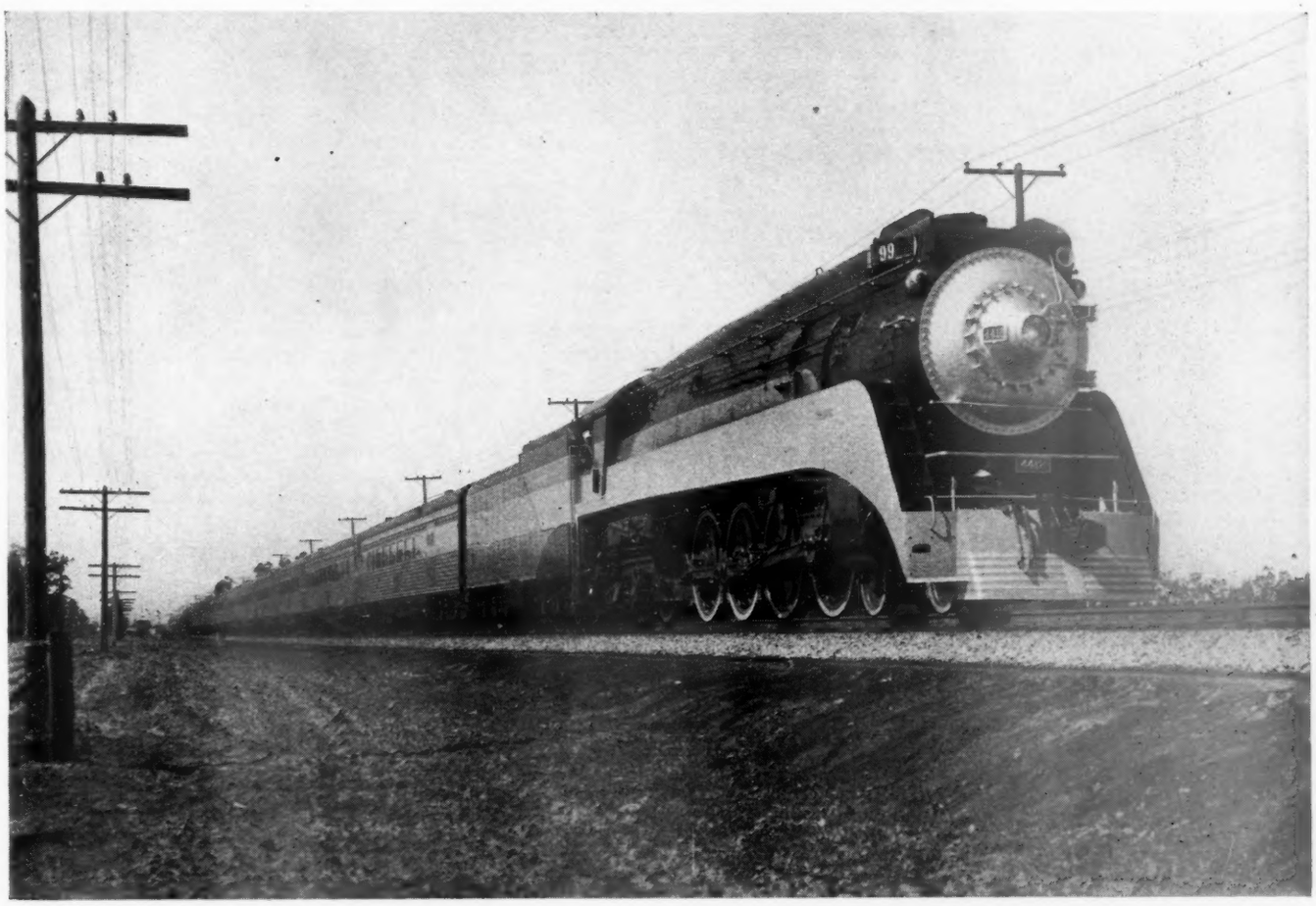
MODERN TRAIN OPERATION REQUIRES...



One of Southern Pacific's famous "Daylight" trains. Lima built locomotives haul these trains.

. . . high starting power

PLUS

high horsepower at high speed

Only modern steam locomotives can economically fulfill these requirements.

Modern steam locomotives, which incorporate proved capacity-increasing factors in their design, are capable of starting heavier trains and delivering a 25 to 30 per cent increase in ton-miles-per-train-hour.

This increased output spreads operating costs over greater tonnage and shows correspondingly increased net earnings.

LIMA LOCOMOTIVE WORKS, LIMA LOCOMOTIVE WORKS INCORPORATED INCORPORATED, LIMA, OHIO

at $800 annually, for four-year college courses, were established in 1907 by the children of the late Frank Thomson, president of the Pennsylvania from 1897 to 1899.

The Sims scholarships, two in number, were established as a memorial to the late John Clark Sims, secretary of the road from 1881 to 1900 and provide full tuition fees for the holders in any department of the University of Pennsylvania. The other of the two scholarships, which are awarded to persons nominated by the trustees of the University, has already been filled.

First French Line 100 Years Old

This year marks the 100th anniversary of the opening of the first French railroad. On August 26, 1837, the Paris to St. Germain route was opened for the whole of its 11½-mile length. Although railways utilizing mule power had been in service in France since the opening of the Andrezieux-Saint Etienne tramway in 1828, the St. Germain road was the first true "railroad" possessing a franchise to operate as common-carrier of freight and passengers by mechanical propulsion.

The road was especially noteworthy in its day for the difficult problems incident to the location of its right-of-way, necessitating the construction of a viaduct for almost two-thirds its length, two crossings of the Seine river, 15 highway grade separations, and two tunnels totaling 550 and 960 ft. in length, respectively. The public antipathy usually displayed toward railway construction at the time was only intensified by fear of the imagined dangers of operation through the tunnels.

As the railway's policies were dictated by the teachings of the great French utilitarian philosopher, Count Saint Simon, it became the training school for new types of business, scientific and social ideas, exercising a lasting effect on the development of French industry in general and the later private railroad systems in particular.

The route is still in service as part of the Paris suburban "outer circle" lines of the State Railway, although its steam locomotives have given way to electrified motive power.

B. & M. to Name Its Locomotives

The Boston & Maine is asking the school children of New England to name 20 of its latest locomotives and promises that the names of the successful "dubbers" and the school which they attend will be carried on metal plates to be permanently attached to the engines so named. In addition, the schools attended by the 20 youngsters who suggest the chosen names will be presented with a framed certificate stating the honors thus bestowed.

In naming its larger "'Mountain' Pacific" type locomotives, the road will be reviving a custom which brought romance to the rails back in the early days when every engine had its own picturesque name. "The plan to have 20 of our new and largest engines named," E. S. French, president of the road, in announcing the plan, declared: "is the result of suggestions from several persons among the thousands who are displaying a renewed interest in railroads. It is intended, frankly, to attempt to capture more of the interest of the younger element who must be our patrons in both passenger and freight service of the future."

The names to be placed on the 20 engines will be announced on November 1, after selection by a judging group of five, including a railroad officer, an officer of a railroad enthusiasts' organization, two well-known members of the educational profession and a prominent historian, all to be announced later. The competition, which ends on October 15, will be limited to New England children up to and including the final year of junior high school.

British Expert Reports on Chinese National System

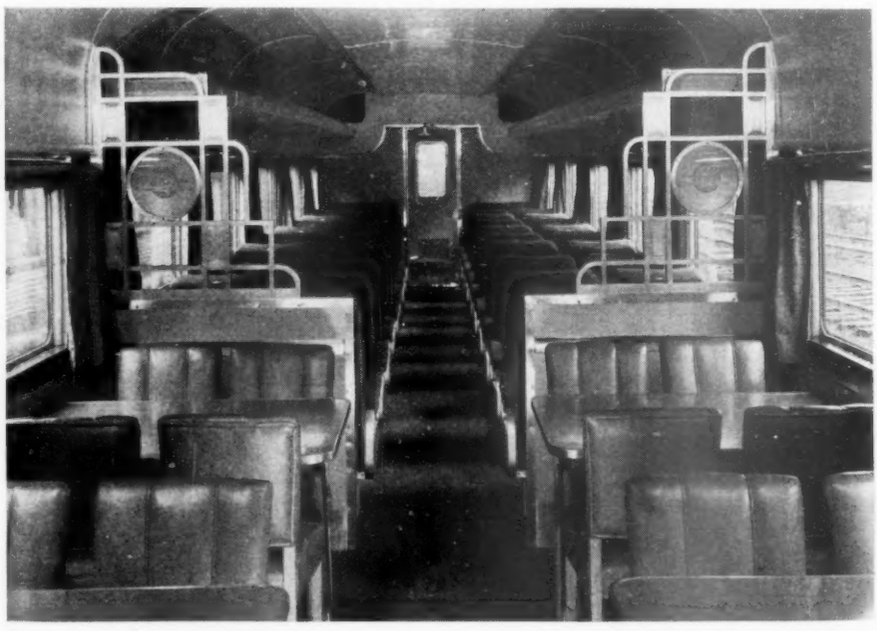
Basing its proposals for betterment on the belief that railways should be considered "commercial undertakings" rather than "public institutions," a report on the Chinese National Railways by T. D. Hammond, British authority on foreign railway operation and policy, has been made public and is summarized in the September 3 issue of the Railway Gazette (London). Most of the report is taken up with suggestions for the reorganization and centralization of the entire staff of the system, with special emphasis on the consolidation of rolling stock maintenance facilities. There appear, however, comments on rate-making and road transport competition which touch upon American problems.

The chief criticism made by the report on rate matters is leveled at the over-standardization and inflexibility of the Chinese freight rate classification. Stamping his approval on the American practice of fixing rates according to "what the traffic will bear," Mr. Hammond argues for the introduction of special rates for specific traffic conditions, the encouragement of long-haul traffic through the granting of rate privileges on this class of shipments, and the lowering of charges on freight destined to, or originating in, the underdeveloped areas of interior China. He also recommends the establishment of fixed uniform rates on shipments between all stations within a zone dominated by chief ports or trade-centers. In short, over all other considerations, he asserts his opposition to standard rates based on distance, and holds that factors of competition, topography, financial conditions, and all other relevant matters should be taken into account in the rate structure. In defense of this principle, he points to the fact that charges on more than 75 per cent of the freight hauled in Great Britain and the United States are levied under special rate classes.

Relative to highway transport, the report states that, since its development in China is insignificant to date, prompt measures to combat competition by road operators, if undertaken immediately, will remove any threat of loss of traffic to the rail carriers. The report suggests that the first move in the passenger field be the abolishment of fourth class fares and the lowering of third class fares (which account for 87 per cent of Chinese passenger revenues) to one cent per mile. It also proposes strict governmental restriction of highway common carriers through licensing provisions. All road construction programs, it feels, should be submitted to the Minister of Railways for approval.

Add Another Car to Zephyr

The Twin City Zephyrs of the Chicago, Burlington & Quincy have been made eight-car trains by the addition of a "dinette" coach. The additional cars, which were added to one train on September 8 and the other on September 10, occupy a position just ahead of the full length diner and are so arranged that patrons in the dinette portion of the car may be served from the adjacent full length dining car. The dinette portion of the car will accommodate 16 persons, thereby increasing the diner capacity of the train from 32 to



The Eighth Car Added to the Twin Cities Zephyrs Has a Capacity for 16 in the Dinette and 40 in the Coach Portions

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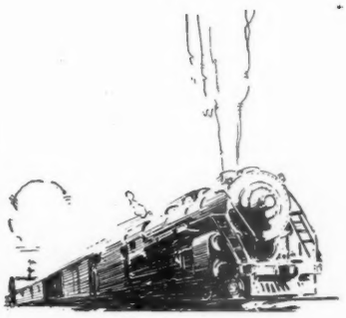
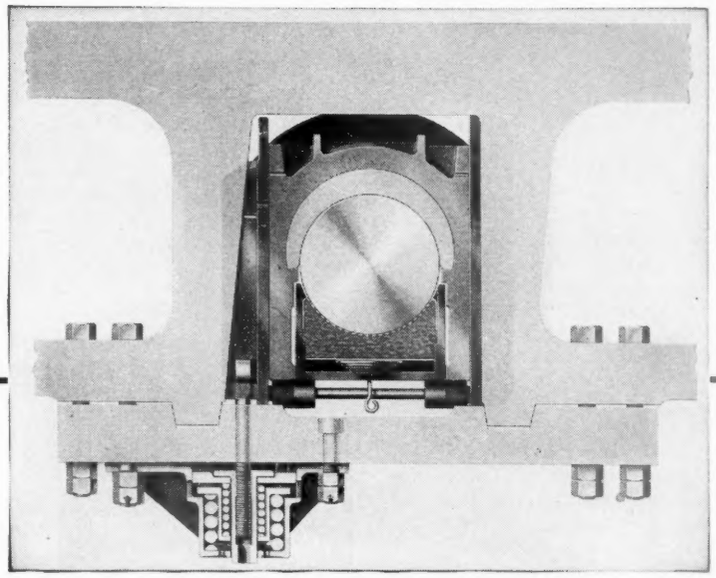
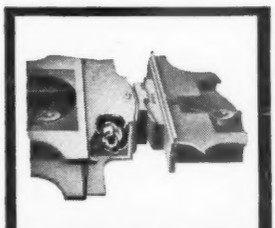
DRIVING BOX SLACK . . .

becomes a Grandfather in *2 Hours!*





It's got Belgian hares beat a city block. » » » A little slack multiplies mighty fast. » » » Ten revolutions with slack driving boxes rack the engine more than 500 miles of travel with snug driving boxes. » » » The Franklin Automatic Compensator and Snubber maintains micrometer adjustment of driving box fit at all times. » » » The compensator member compensates for wear and for box expansion due to temperature change. » » » The snubber member cushions and absorbs unusual shocks. » » » Driving boxes are always in complete adjustment, which makes for easier riding and lower maintenance. » » » Its twin, the Radial Buffer, performs the same function between engine and tender and further improves riding qualities and lowers maintenance.



Franklin Type E-2 Radial Buffer dampens oscillation between engine and tender and makes for easier riding.

Because material and tolerances are just right for the job, genuine Franklin repair parts give maximum service life.

REG. U.S. PAT. OFF.

FRANKLIN RAILWAY SUPPLY CO., INC.

NEW YORK CHICAGO MONTREAL

48. The coach portion will accommodate 40 passengers, thereby increasing the coach capacity of the train from 120 to 160.

The interior appointments and decorations in the new cars, while in harmony with adjoining equipment, include some modifications. One departure from standard practice is the arrangement of one end which, through the omission of the conventional vestibule, permits food to be relayed directly from the adjoining car kitchen to a service pantry, from which dinette patrons may be served.

British Roads Expand Expedited Freight Service

The four main-line British roads have in five years increased the total number of daily manifest freight runs from 338 in 1932 to 661, as of August of this year. These fast freight trains, with few exceptions, provide over-night service between all important commercial centers in England, with second-day delivery to the more remote sections of Scotland and the Cornwall area.

To provide this service, the railways have effected a virtual revolution in British freight handling and train operation. They have built freight cars equipped with automatic brakes designed for inclusion in high-speed trains (the bulk of British freight cars still not having air or vacuum brakes). These improvements, together with heavier and faster motive power and the inauguration of passenger-train practices in the road operation of the fast freight trains, have made possible average speeds of 40 to 45 m.p.h. and speedy runs between points 400 and 500 miles apart.

The Great Western, for example, recently placed in operation between Birkenhead and London a new expedited freight train which, with two stops involving complicated switching movements, makes the 210-mile run in less than seven hours, a reduction of 3 hours under the time of the fastest previous train. This service, with connecting roads quickening their schedules for the purpose of interchange with the new manifest, has effected a considerable saving in the transit time of merchandise between the manufacturing districts of the north and midland sections and the large areas of London and the nearby so-called "home counties."

On the London, Midland & Scottish freight service betterments have also been the center of attention. In the past year, 16 daily runs have been speeded up by an average of seven per cent of their previous schedule requirements, the saving of time ranging from ten to 52 minutes per train. The most striking improvement and that involving the most important traffic route is the inauguration of a one-day service between London and Glasgow which is scheduled to run over the 300-mile section between London and Carlisle in 9½ hours.

The speed-up program in through freight service has brought attention to another problem—that of providing direct overnight schedules between the smaller industrial and agricultural centers of the country. Until recently, shipments between such points have been subjected to undue delays through circuitous routing and the necessity of numerous re-loadings at interchange points. The peculiar compactness of the British industrial areas and the great number of small commercial centers, coupled with the heavy direct traffic between such centers, has made this problem a large issue in railway affairs. A special study is now under way by a committee representing the four main-line roads with a view to substituting direct cross-country services for the customary complicated transhipment arrangements. Already considerable progress has been made in practice, represented by the inauguration of "belt" trains and single-unit l.c.l. motor-rail cars.

Would Make Station-to-Station Truckers Common Carriers

Motor carriers operating in line-haul station-to-station service under contracts with railroads are first of all common carriers and should be required to obtain certificates of public convenience and necessity as such, according to the recommended findings of a report submitted to the Interstate Commerce Commission by Joint Board No. 1 on the application of the Willett Company of Indiana, highway affiliate of the Pennsylvania, for a permit to operate as a contract carrier in station-to-station service for that road over six routes between points in Illinois, Indiana and Kentucky.

The board, which is composed of Andrew Olson of Illinois, Samuel L. Trabue of Indiana and H. S. Collins of Kentucky, recommends that the application be dismissed without prejudice to a reopening of the proceeding "upon the filing of appropriate pleadings." The report states that counsel for more than 350 common and contract carriers operating in the territory appeared in opposition, and counsel for 27 western railroads intervened and filed a brief opposing the application.

The board deals first with its authority to hear the case, which had been challenged, and proceeds to discuss that nature of the service proposed. It examines the definition of "common carrier by motor vehicle" in section 203 of the Motor Carrier Act and emphasizes the words "including such motor vehicle operations of carriers by rail or water, and of express or forwarding companies, except to the extent that these operations are subject to Part I."

"The emphasized words," the report concludes, "make it clear that line-haul motor-vehicle operations of railroads now are subject to part II, leaving their motor-vehicle operations within terminal areas subject to part I. As no other definition in part II makes reference to 'carriers by rail or water,' and bearing in mind the requirements of section 206, we conclude that existence of common-carrier authority is necessary where motor-vehicle operations of a line-haul character are proposed to be used by a railroad. We arrive at this conclusion independently of the several court decisions cited by the parties, and it is unnecessary to review those decisions. Nor is it necessary to determine whether, in addition to the existence of common-carrier authority, a corporate entity such as the one here before us need be provided with contract-carrier authority in order lawfully to serve a railroad under the circumstances here disclosed. All we here find is that unless and until common-carrier authority is prayed for over the routes in question it is premature for us further to consider the instant prayer for a permit to operate as a contract carrier. Stated otherwise, a condition precedent to institution of service over the routes in question is the existence of a certificate of public convenience and necessity. As an application for granting authority of that character is not now on file with the commission, we find that the instant application should be dismissed without prejudice to reopening the proceeding upon the filing of appropriate pleadings not inconsistent with these findings."

New Haven Hearing Over to November

(Continued from page 381)

one of the intervenors observed that "our expert has analyzed this study and agrees that it is carefully and scientifically prepared."

Mr. Dorigan, after revising some of his exhibits by the inclusion of the latest available figures, was questioned at some length by Mr. Hays with reference to the charging of the Old Colony deficit against the first and refunding mortgage bonds. After much discussion between witness and counsel on methods of segregation and bases of allocation, Commissioner Mahaffie suggested that Mr. Hays prepare in writing and submit to Mr. Dorigan an outline of the calculations which he desired to have made.

Replying to questions of counsel for Old Colony stockholders, Mr. Dorigan said that no studies had been made of what the Old Colony situation would be with the Providence, Warren & Bristol eliminated, but added that P. W. & B. results have been such that its elimination "from any system would benefit that system." Nor did Mr. Dorigan have any figures on the cost to the Boston & Providence of maintaining Boston's Back Bay station.

Mr. Carmichael was led by Mr. Hays through an item-by-item discussion of New Haven investments in affiliated companies as the latter sought to show that the value of these had been overstated on the pro forma balance sheet of the reorganized company. Asking in each instance what the return in 1936 had been and whether considerations other than the financial return were involved, Mr. Hays calculated at the close of such examination that the net return on the investments set up at $71,000,000 was not more than $650,000 and that not more than $5,000,000 of the $71,000,000 represent investments "necessarily and inherently connected" with the New Haven system. Mr. Carmichael insisted, however, that it is unfair to pick out particular balance sheet items for such scrutiny; he conceded that some of the figures, all of which he called tentative, will have to be revised downward but added that others will have to be revised upward. And he thinks that the balance sheet as a whole is reasonable.

Prior to Mr. Carmichael's testimony the

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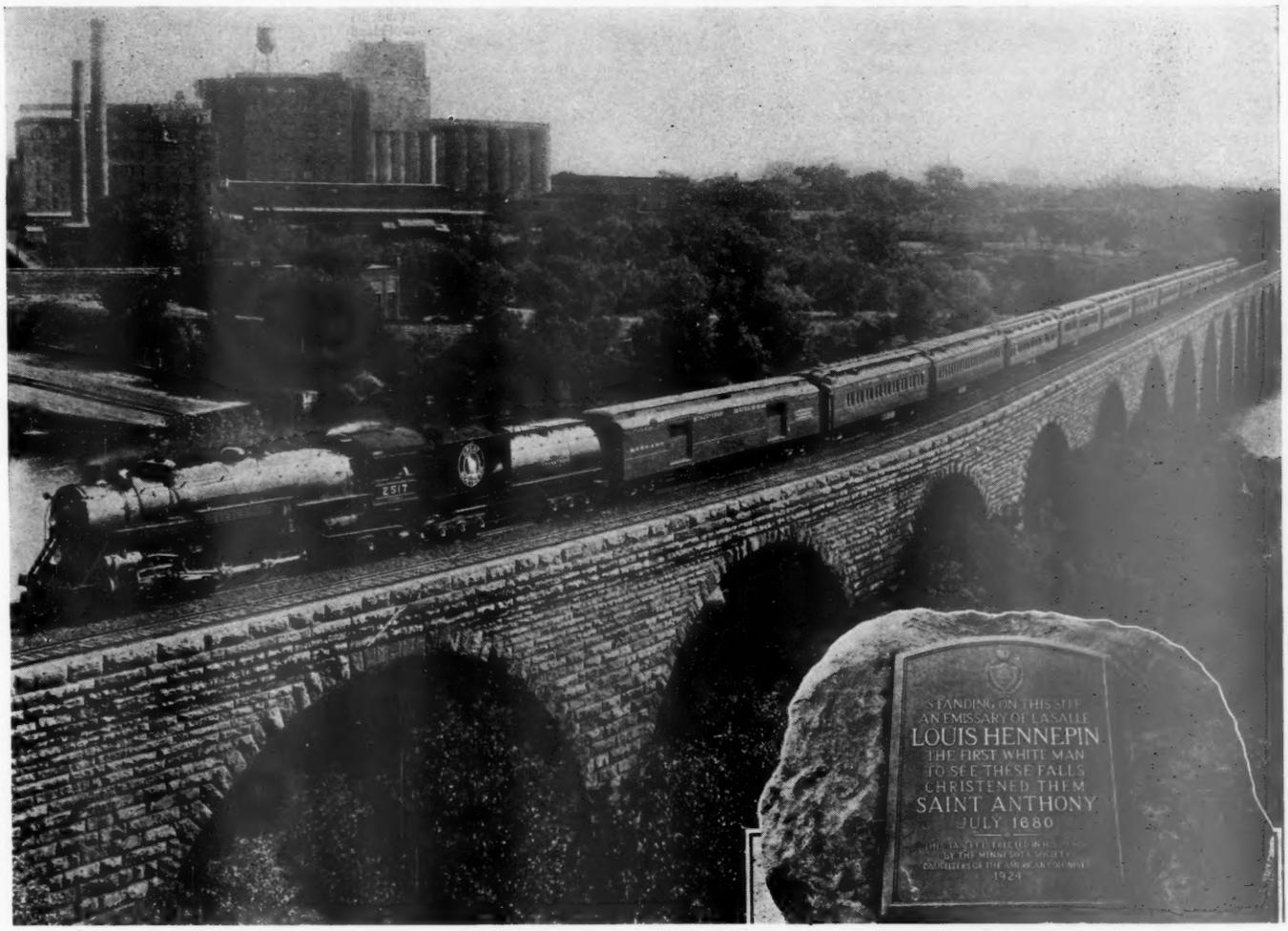
NO. 32 OF A SERIES OF FAMOUS ARCHES OF THE WORLD



THE GREAT NORTHERN BRIDGE AT MINNEAPOLIS

This photograph shows the Great Northern's crack train, the Empire Builder, crossing the Mississippi River over the famous stone arch bridge at Minneapolis. Near the east end of this span is a monument with the following inscription: "Standing on this site Louis Hennepin, the first white man to see these falls, christened them Saint Anthony." The harnessing of this water power was responsible for the growth of the little town of St. Anthony into the present city of Minneapolis. One of the flour mills for which the city is famous is seen in the background.

The bridge, with its massive masonry, lofty arches, and graceful curvature, recalls the solidity of the work of Roman antiquity. It is one of the finest stone viaducts in the world. Because of the length and curvature of the span passengers can see the bridge, and its height also commands a view of the city's skyline.

It consists of 23 arches and is 2,100 feet long, 76 feet high and 28 feet wide. Completed in 1893, it is the only structure on the Great Northern Railway on which is inscribed the name of the founder of the system, James J. Hill, who later became famed as the Empire Builder.

The locomotive shown was the first to make a round trip between the Mississippi River and the Pacific Ocean without a stop except to change engineers and take on water and fuel oil. In one direction it pulled the fast mail train; in the other a silk special. In honor of this 3,700-mile jaunt the name Marathon was assigned in place of No. 2517.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

proposal of the State of Rhode Island had been submitted by its counsel, Wilbur La Roe, Jr. It took the form of an application seeking the reopening of the commission's consolidation plan and its modification by designating the Providence & Worcester as an independent terminal property. Under such a setup, it is asserted, the New Haven's "monopoly of the railroad transportation of the state of Rhode Island" would be broken. It is pointed out that the Providence & Worcester "serves Providence with adequate terminals and connects at Worcester, Mass., with the Boston & Maine and the Boston & Albany, and as an independent bridge and terminal railroad would make available to the greater part of the commerce and industry of the state of Rhode Island the routes and services of these two competing railroads and the routes and services of all trunk-line railroads reaching the New England gateways."

The so-called Insurance Group offered the testimony of James H. Brewster, Jr., treasurer of the Aetna Life Insurance Company, and H. C. Hagerty, treasurer of the Metropolitan Life Insurance Company, who introduced what Mr. Brewster called "not a plan but a series of objections and proposed amendments" to the debtor's plan. Other witnesses for this group were John E. Slater, a member of the firm of Coverdale & Colpitts, and M. C. Kennedy of that firm's staff. Mr. Slater was formerly assistant to general manager of the New Haven and Mr. Kennedy served for a time as Eastern Regional Director in the organization of former Co-ordinator Eastman.

Among other objections to the debtor's plan the Insurance Group which holds $55,718,000 of New Haven securities opposes the transfer to the reorganized company of the Old Colony and the Providence, Warren & Bristol. Severance of these, it claims, would leave $1,300,000 more a year for New Haven fixed charges. Also, unless the plan for the separate operation of the Old Colony provides an equitable proposal for the use by the New Haven of the Boston & Providence, the Insurance Group favors the development of the New Haven's alternate Boston-Providence route. The latter, the New Haven plan describes as a route via Valley Falls, R. I., Adamsdale, Mass., and Franklin, entering Boston over the lines of the New England. After improvements, estimated to cost about $3,000,000, the plan continues to say, it would be practicable to divert substantially all freight traffic over this route. It adds, however, that passenger service would perhaps have to be continued over the present route under an operating agreement with the Boston & Providence. On this point Chairman Buckland had testified that he "certainly thinks the Boston & Providence is essential to the New Haven system."

Counsel at the hearing agreed that they would prefer to defer cross-examination of the Insurance Group's witnesses, and thus Commissioner Mahaffie, hearing no objection, adopted the suggestion of counsel for the Old Colony as to the October 11 date for the filing of plans and the November hearing.

Equipment and Supplies

FREIGHT CARS

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered 100 forty-foot 50-ton steel box cars from the Pullman-Standard Car Manufacturing Company. Inquiry for this equipment was reported in the *Railway Age* of July 3.

PASSENGER CARS

Correction

The item in the *Railway Age* of July 10, page 53, reporting an order for 1,000 gondola cars of 70 tons' capacity, placed by the Chicago, Milwaukee, St. Paul & Pacific in its own shops, is incorrect in that these cars were included in a previous order for 2,022 cars reported in the *Railway Age* of April 17, page 695.

THE PENNSYLVANIA is inquiring for 19 light-weight passenger train cars, to include six coaches, four passenger-baggage cars, four baggage-mail cars and five dining cars.

IRON AND STEEL

THE NEW YORK CENTRAL is inquiring for 5,000 tons of steel rail and angle bars.

PENNSYLVANIA.—A contract has been given to the Bethlehem Steel Company for 370 tons of steel to be used in connection with grade crossing elimination work at Montour Falls, N. Y. A. S. Wikstrom, Bound Brook, N. J., has the general contract for this work.

SIGNALING

CHICAGO, ROCK ISLAND & PACIFIC.—This company has authorized the construction of automatic block signaling between Pratt, Kan., and Tucumcari, N. M., extending the signaling which is now under way under the 1937 program between Herington, Kan., and Pratt. This will complete the automatic block signaling on the entire Golden State route from Chicago to Los Angeles, Cal., this type of protection already being in service on the Southern Pacific between Tucumcari and Los Angeles. The Rock Island has also authorized new signaling on the route between Manly, Iowa, and St. Paul, Minn. Various sections of new signaling, totaling 84 miles, are to be installed in this territory.

MOTOR VEHICLES

THE SACRAMENTO NORTHERN has received delivery of two 28-passenger buses from the American Car & Foundry Motors Company.

MISCELLANEOUS

THE AMERICAN STEEL AND WIRE COMPANY has awarded a contract to the American Bridge Company for the construction of five additions to buildings at its Cuyahoga plant, Cleveland, Ohio.

Construction

CENTRAL OF NEW JERSEY.—This company has applied to the Interstate Commerce Commission for authority to construct an industrial spur from Tremley Station to Pleasant Street in Linden, N. J., 1.7, miles and from this spur to the Mather Spring Company on Stiles Street in Linden, 6 mile. The petition states that the company feels that since the track is only an industrial spur, the commission does not have to authorize its construction, but that it is asking the commission to determine the status of the line so that there will be no dispute after the line is completed.

NEW YORK, NEW HAVEN & HARTFORD—This company has authorized the reconstruction of bridge 28.84, to cost $34,000, and replacing slips with crossovers, to cost $40,000, at South Norwalk, Conn.

PENNSYLVANIA.—Bids have been received by this company for the furnishing of a modern car dumper for installation at the foot of King street in Sandusky, Ohio. The dumper will be used for the transfer of coal from cars to boats on Lake Erie. This company has also sent out requests for bids on the work of constructing 3,500 ft. of dock at this point and for the necessary dredging and channel work. It is estimated that the total cost of this project will be about $4,000,000.

PENNSYLVANIA.—Construction work, to cost about $900,000, is now in progress in the eastbound yard at Enola, Pa., according to a statement by H. W. Jones, general superintendent. The work consists of a consolidation of the two humps into one major hump over which all eastbound freight cars will hereafter pass in classifying them into solid trains, all to be moved on fixed schedules at high speed to their destinations. This will provide more flexibility in operation in the yard, eliminate re-handling of cars and increase the peak eastbound movement to a maximum of 4,500 to 5,000 cars a day, which, at present, is about 4,000 cars. The new hump and classification yard will require changing thousands of feet of yard tracks, and the installation of new switch and signal apparatus. Three new towers will be built, as well as new car inspection pits under the tracks. The same principle of gravity hump operation now in vogue in the classification of freight cars will be followed, with the exception that the tracks leading from the new hump will be equipped with electrically controlled car retarders, similar to those at present in operation at Pittsburgh and in the Potomac yard near Washington, D. C. Work on this project was started several months ago, is well under way and is expected to be completed and in service early next year. It is being carried out by the John F. Casey Company, Pittsburgh, Pa., with branch headquarters offices at Harrisburg. F. W. Heckel, Jr., is the railroad company's resident engineer in charge.

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DEPENDABLE

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LOW INITIAL COST

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Representative of American Throttle Company, Inc.

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Canada:
The Superheater Company, Limited, Montreal

Superheaters
Feed Water Heaters
Exhaust Steam Injectors
Tangential Steam Dryers
Superheated Steam Pyrometers
American Throttles

A-1177

Supply Trade

Baldwin Reorganization

The Baldwin Locomotive Works has circularized its security holders, informing them of the confirmation of its plan of reorganization by the federal district court at Philadelphia. In conformance with the plan, security owners are asked to surrender their holdings for exchange or stamping as follows: First mortgage 5 per cent bonds, 1940, to receive $20 per $1,000 bond upon being stamped; five-year 6 per cent consolidated mortgage bonds, offered two options, one of them being to receive 80 shares of new common stock ($13 par) for each bond; 7 per cent cumulative preferred stock and no-par common stock, to receive new stock pro rata in exchange.

Ralph C. Harden has been appointed general manager of the eastern division of the **Gustin-Bacon Manufacturing Company,** Kansas City, Mo. Mr. Harden, who will have his headquarters at New York, has had an extensive sales and executive experience. For a number of years he was associated with the Johns-

Ralph C. Harden

Manville Sales Corporation as salesman, insulation and packing sales manager, division manager and regional vice-president, with headquarters at Chicago. For the past three years, he has served as a general department sales manager with the United States Rubber Products, Inc., New York.

D. C. Brooks has been appointed sales promotion manager of the **Westinghouse Electric International Company,** with headquarters at New York.

The Chicago Pneumatic Tool Company, New York, has opened a direct factory sales and service branch at 119 West Second South, Salt Lake City, Utah, and has appointed **Otto A. Ray** manager.

Steel & Tubes, Inc., a subsidiary of the **Republic Steel Corporation,** Cleveland, Ohio, has opened a branch office in Baltimore, Md., with **H. H. Smith** in charge.

The Linde Air Products Company, unit of the **Union Carbide and Carbon Corporation,** has opened a new sales office in Oakland, Cal., at 3710 San Pablo avenue.

The partnership Thomas Prosser & Son, heretofore consisting of Richard Prosser and Roger D. Prosser, doing business at 15 Gold street, New York, has been dissolved by the death of Richard Prosser on July 12. **Roger D. Prosser** will continue to conduct the business of that partnership under the name of **Thomas Prosser & Son** at the same address.

Howard V. Harding has become associated with **Lukenweld, Inc., Division** of **Lukens Steel Company,** Coatesville, Pa., as district sales manager in the metropolitan territory with headquarters at 120 Liberty street, New York. He previously served since 1927 as chief engineer of Peter Clark, Inc., New York.

TRADE PUBLICATION

COLOR AND DESIGN.—"Color and Design in Passenger Equipment" is the title of a new 26-page brochure recently issued by the Pullman-Standard Car Manufacturing Company, Chicago, which illustrates the special service provided by this company in executing the interiors and exteriors of passenger cars and trains. According to the brochure, this service is complete, embracing architectural features, colors, decorations, fabrics, floor coverings and other details of the finished job. The brochure, printed in colors, gives a remarkably accurate and striking impression of what has been accomplished with modern materials, fabrics and colors in most of the recent new trains and cars, "styled" by Pullman-Standard. The trains illustrated include the Union Pacific "City of Denver," the Illinois Central "Green Diamond," the Southern Pacific "Daylight," the Pullman articulated cars "Advance" and "Progress," as well as some of the cars in the new 14-car streamliners which are being built for the Chicago & North Western, the Union Pacific and the Southern Pacific.

Financial

BEAUFORT & MOREHEAD.—*Acquisition.*—The Interstate Commerce Commission, Division 4, has authorized this company to acquire a line of the Norfolk Southern extending from Morehead City, N. C., to Beaufort, 3.17 miles.

CHICAGO & EASTERN ILLINOIS.—*Abandonment.*—The trustee has applied to the Interstate Commerce Commission for authority to abandon a portion of a branch line extending from Standard, Ind., to Hymera, 3 miles.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Abandonment and Joint Ownership and Operation.*—The Interstate Commerce Commission, Division 4, has authorized the trustees to abandon a branch line extending westerly from Cannon Junction, Minn., to Cannon Falls, 17.46 miles, and to acquire a one-half interest in and jointly operate a branch line, owned by the Chicago Great Western, extending from Red Wing, Minn., to Cannon Falls, 21.6 miles.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC. — *Reorganization.* — The Interstate Commerce Commission, Division 4, has denied the petition of the trustees requesting that the final hearing in the reorganization of this company be postponed indefinitely.

CHICAGO, ROCK ISLAND & PACIFIC.—*Refunding.*—The Interstate Commerce Commission has taken under advisement the question of permitting the trustees to issue $28,172,650 of certificates of indebtedness to refund outstanding equipment obligations. The refunding has been sanctioned by the Chicago Federal court, subject to the commission's approval.

JACKSONVILLE & HAVANA. — *Auction Sale.*—The district court at Springfield, Ill., has set October 4 as the auction date of the Jacksonville & Havana, which was established in July, 1926, following the breakup of the 84-year-old Chicago, Peoria & St. Louis. The sale is to be held at Virginia, Ill.

JACKSONVILLE & HAVANA.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized the receiver to abandon as to interstate and foreign commerce the entire line extending from Havana, Ill., to Jacksonville, 41.7 miles, and to abandon operation under trackage rights over the line of the Chicago, Burlington & Quincy between Jacksonville, Ill., and Waverly, 18.3 miles.

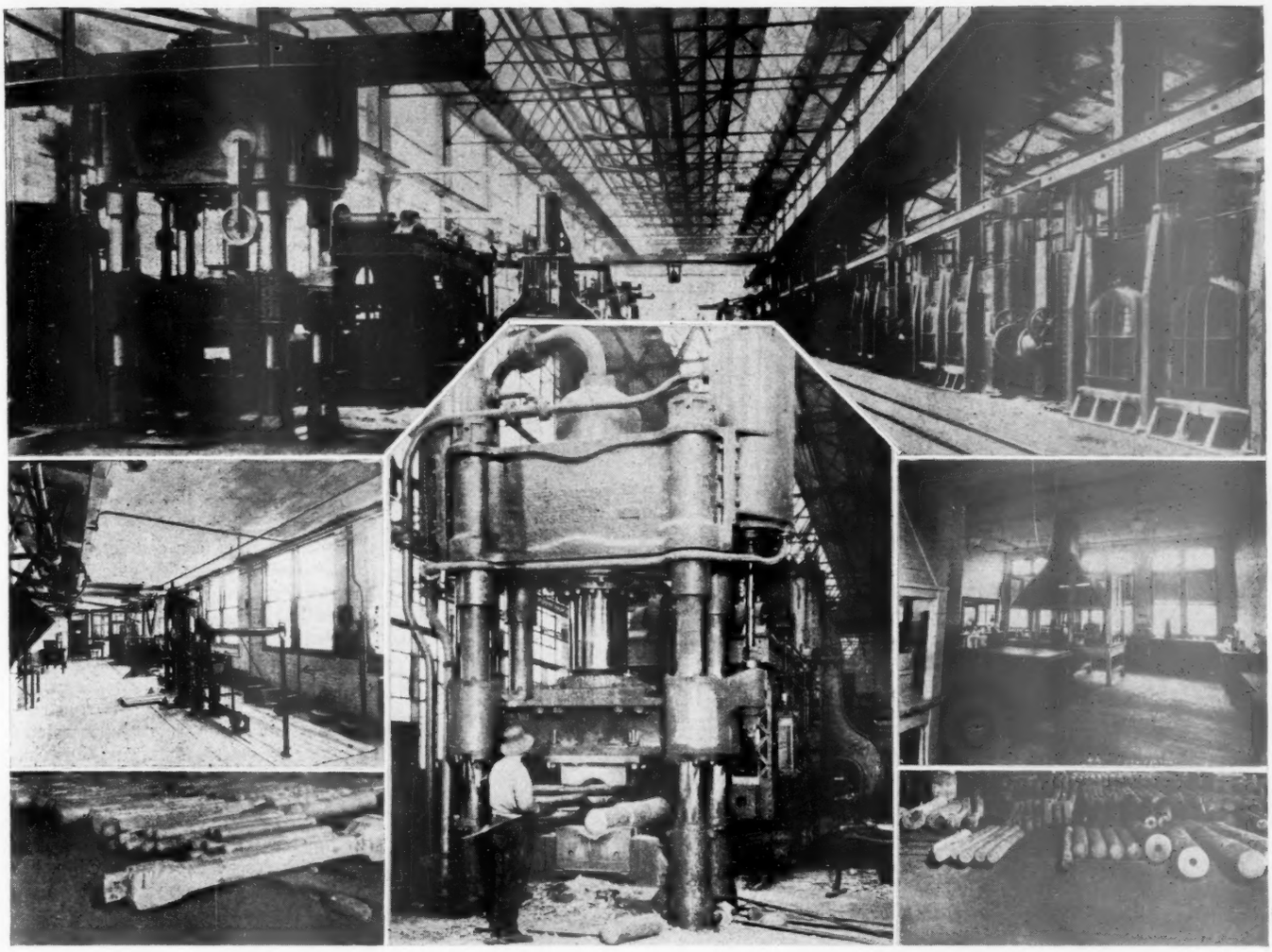
MAINE CENTRAL.—*Abandonment.*—This road has applied to the Interstate Commerce Commission for authority to abandon its 11.26-mi. line from Crowleys Junction, Me., to Leeds Junction, and its 2.38-mi. line from Mt. Desert Ferry, Me., to Waukeag. The latter has had no traffic since the discontinuance of the steamboat service to Mt. Desert Island in 1931.

MAINE CENTRAL.—*Acquisition.*—The Interstate Commerce Commission, Division 4, has authorized this company to acquire a part of the line of railroad of the Lime Rock extending from a point of connection with the Maine Central in the south end of Rockland, Me., in a northerly direction to Tilson Wharf and Crocketts Point, 1.5 miles.

MINNEAPOLIS & ST. LOUIS.—*Abandonment.*—Examiner J. S. Prichard of the Interstate Commerce Commission, Division 4, in a proposed report to the commission, has recommended that it deny the application of the receivers to abandon a branch line extending from St. Benedict, Iowa, to Algona, 8.5 miles.

MISSOURI-KANSAS-TEXAS. — *Adjustment Bond Interest.*—This company will not pay interest on its adjustment bonds due at this time, which will bring the accumulation upon them to 10 per cent. In April a 5 per cent payment, representing a full year's interest, was paid on the bonds.

Continued on next left-hand page



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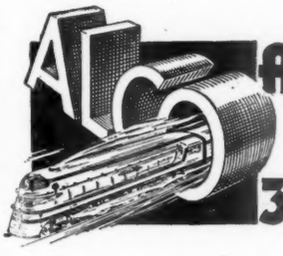

AMERICAN LOCOMOTIVE COMPANY

30 CHURCH STREET·NEW YORK·N·Y

MOBILE & OHIO.—*Abandonment.*—The receivers of this company have applied to the Interstate Commerce Commission for authority to abandon a branch line of the Warrior Southern extending from Tidewater, Ala., to Kellerman, 13.6 miles.

NEW YORK, NEW HAVEN & HARTFORD.—*Abandonment.*—Examiner Jerome K. Lyle of the Interstate Commerce Commission, in a proposed report to the commission, has recommended that it deny the application of the trustees to abandon a branch line extending from Windsor Locks, Conn., to Suffield, 3.9 miles. The proposed report charges that the trustees allocated to the branch larger expenses than it should have reasonably borne and recommends that the branch be maintained if there is an increase in traffic.

NEW YORK, NEW HAVEN & HARTFORD.—*Abandonment.*—Examiner Jerome K. Lyle of the Interstate Commerce Commission, in a proposed report to the commission, has recommended that the trustees of the Hartford & Connecticut Western be permitted to abandon the lines and the trustees of the New Haven to abandon operation of the lines between Griffins Station, Conn., and Tariffville, 2.71 miles, and between Tariffville, Conn., and Agawam Junction, Mass., 14.3 miles.

NEW YORK CENTRAL.—*Securities.*—The Interstate Commerce Commission, Division 4, has amended its order of April 25, 1934, so as to authorize this company to substitute $52,288,000 of uncapitalized expenditures for owned equipment and equity in trust equipment for the $54,000,000 of uncapitalized capital expenditures previously authorized to be substituted for $48,000,000 of 4 per cent consolidation-mortgage bonds, series C, and $6,000,000 of 3½ per cent gold mortgage bonds, originally pledged as collateral security for the $59,911,100 of 10 year 6 per cent convertible secured bonds.

SEABOARD AIR LINE.—*Bonds of the Tampa Northern.*—The Interstate Commerce Commission, Division 4, has authorized the Tampa Northern to extend from July 1, 1936, the maturity date of $1,258,000 of first mortgage bonds and to modify the interest rate pursuant to the provisions of a proposed agreement, dated August 9, 1937, to be made between Tampa Northern, its first mortgage bondholders, and the receivers of the Seaboard Air Line.

Average Prices of Stocks and Bonds

	Sept. 14	Last week	Last year
Average price of 20 representative railway stocks..	41.70	42.92	55.09
Average price of 20 representative railway bonds..	76.08	76.81	83.20

Dividends Declared

Dover & Rockaway.—$3.00, semi-annually, payable October 1 to holders of record September 30.

Joliet & Chicago.—Guaranteed, $1.75, quarterly, payable October 4 to holders of record September 21.

St. Louis, Rocky Mt. & Pacific.—25c; Preferred, $1.25, quarterly, both payable September 30 to holders of record September 15.

Southern-Mobile & Ohio.—Stock Transfer Certificates, $2.00, payable October 1 to holders of record September 15.

Virginian.—Preferred, $1.50, quarterly, payable November 1 to holders of record October 16.

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

C. F. Lodter, chief clerk in the auditing department of the Atchison, Topeka & Santa Fe at Amarillo, Tex., has been appointed to the newly-created position of assistant auditor of the Coast lines, with headquarters at Los Angeles, Cal.

Carl M. Jacobs has been appointed general solicitor of the Cincinnati, New Orleans & Texas Pacific, the Harriman & Northeastern and the Cincinnati, Burnside & Cumberland River—units of the Southern Railway System—with headquarters at Cincinnati, Ohio. Mr. Jacobs, who succeeds the late Judge John W. Peck, has been associated with Frost & Jacobs of Cincinnati.

OPERATING

John H. Fish, assistant division superintendent of the Louisville & Nashville at Evansville, Ind., has been appointed superintendent of the Evansville division, succeeding **A. B. Scates,** deceased.

D. C. Gough, roadmaster on the Clearwater division of the Canadian National, has been appointed acting assistant superintendent, with headquarters at Kamloops, B. C., succeeding **J. P. Kirkpatrick,** deceased.

TRAFFIC

Z. M. Kincaid, division passenger agent of the New York, Chicago & St. Louis, with headquarters at Buffalo, N. Y., has retired from active service at his own request, after 43 years of service with this road. **C. H. Garn** has been appointed general agent, passenger department, at Buffalo. **E. D. Burnett** has been appointed general agent, passenger department, at St. Louis, Mo. **James E. McInnis** has been appointed district passenger agent at Milwaukee, Wis., succeeding **Arthur La Pointe,** promoted.

Edward J. Meade, district passenger agent on the Illinois Central at Chicago, has been appointed general passenger agent, with headquarters at Memphis, Tenn., to succeed **Edgar R. Vaughn,** who has been appointed district passenger agent at Jacksonville, Fla. **Wayne A. Johnston,** office manager for the vice-president in charge of traffic, has been appointed general traffic agent, in charge of mail, baggage, express and merchandise, with headquarters at Chicago. **John D. Cameron** has been appointed general traffic agent, with headquarters at Omaha, Neb., to succeed **Ernest J. Carr,** who has been transferred to Birmingham, Ala., to replace **E. F. Stovall,** general agent, who has retired after 46 years service with this company. All these appointments became effective on September 1.

ENGINEERING AND SIGNALING

R. C. Arnold, engineer of surveys of the Chicago Great Western, with headquarters at Chicago, has been appointed acting division engineer of the Illinois division with headquarters at Oelwein, Iowa, succeeding **H. E. Gardner,** deceased.

Gordon H. Beasley, assistant engineer on the Eastern Kentucky division of the Louisville & Nashville, has been promoted to division engineer of the same division, with headquarters at Ravenna, Ky., succeeding **A. F. Frendberg,** who has resigned. **Howard C. Forman,** assistant engineer on the Cumberland Valley division, has been promoted to assistant division engineer of the same division, with headquarters at Middlesborough, Ky.

W. H. Rochester has been appointed to the re-established position of district engineer of the Southern district, Western lines, Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex. This position was last filled by **R. A. Rutledge,** who retired on September 1, 1932. Previous to his appointment, Mr. Rochester held the title of construction engineer, in which capacity he was in charge of the construction of the Santa Fe's recently completed line between Amarillo, Tex., and Las Animas, Colo.

B. J. Schwendt, assistant signal engineer of the New York Central, lines west, with headquarters at Cleveland, Ohio, has been appointed to the same position on the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, Ohio, succeeding **Carl F. Stoltz,** signal engineer, who died recently. **H. D. Abernethy,** chief signal inspector of the New York Central, lines west, with headquarters at Cleveland, has been promoted to assistant signal engineer of the same lines to succeed Mr. Schwendt. **C. D. Cronk,** signal supervisor, with headquarters at Cleveland, has been promoted to chief signal inspector of the Lines West to succeed Mr. Abernethy. **R. E. Green,** assistant signal engineer of the Michigan Central, with headquarters at Detroit, Mich., has been placed in charge of signaling matters on that road, reporting to **F. B. Wiegand,** signal engineer of the New York Central, with headquarters at Cleveland, Ohio, whose jurisdiction (as reported in previous issues of the *Railway Age*) has been extended to include all lines comprising the New York Central System, with the exception of the Pittsburgh & Lake Erie and the Boston & Albany.

OBITUARY

William K. Struss, president and freight traffic manager of the Bush Terminal railroad, died on September 13 at his home in Staten Island, N. Y., at the age of 41 years.

A. R. McCallum, assistant advertising manager of the New York Central, with headquarters at Chicago, died in Cincinnati, Ohio, on September 13, after a long illness.

Table of Revenues and Operating Expenses appears on next left-hand page

Make——— POWER WORK FOR A LOWER COST

INSIDE the valves and cylinders—between the crossheads and guides—between the pedestal jaws and driving boxes and inside the connecting rod holes designed for floating bushings are some mighty important parts which influence vitally the cost of locomotive operation.

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Operating Revenues and Operating Expenses of Class I Steam Railways

Compiled from 138 Monthly Reports of Revenues and Expenses Representing 142 Class I Steam Railways

FOR THE MONTH OF JULY, 1937 AND 1936

Item	United States		Eastern District		Southern District		Western District	
	1937	1936	1937	1936	1937	1936	1937	1936
Miles of road operated at close of month	235,637	236,359	58,156	58,437	44,780	44,888	132,701	133,034
Revenues:								
Freight	$293,107,091	$283,879,335	$117,238,283	$116,858,823	$52,887,611	$52,750,888	$122,981,197	$114,269,624
Passenger	42,060,658	39,144,500	23,014,108	21,095,474	4,901,227	4,536,007	14,145,323	13,513,019
Mail	7,810,508	7,506,647	2,984,940	2,890,648	1,361,908	1,325,390	3,463,660	3,290,609
Express	4,214,399	3,407,189	1,781,771	1,287,862	647,218	584,133	1,785,410	1,535,194
All other transportation	8,156,649	7,515,702	4,273,683	3,930,843	703,431	692,097	3,179,535	2,892,762
Incidental	9,053,454	7,533,265	4,419,832	3,737,428	960,908	851,588	3,672,714	2,944,249
Joint facility—Cr.	1,058,857	936,241	297,110	277,576	216,427	237,177	545,320	421,488
Joint facility—Dr.	313,381	251,968	58,476	53,580	24,574	24,534	230,331	173,854
Railway operating revenues	365,148,235	349,670,911	153,951,251	150,025,074	61,654,156	60,952,746	149,542,828	138,693,091
Expenses:								
Maintenance of way and structures	47,656,218	42,447,321	17,977,148	15,536,225	7,490,357	7,112,931	22,188,713	19,798,165
Maintenance of equipment	70,666,536	65,506,868	31,133,697	28,941,268	12,981,753	12,045,385	26,551,086	24,520,215
Traffic	9,053,717	8,840,773	3,336,094	3,324,596	1,626,774	1,601,506	4,090,849	3,914,671
Transportation	125,259,881	115,665,172	56,075,474	52,009,404	19,459,552	18,326,209	49,724,855	45,329,559
Miscellaneous operations	3,706,070	3,300,896	1,587,161	1,387,137	356,580	289,164	1,762,329	1,624,595
General	10,841,354	13,165,255	4,338,804	5,780,216	2,062,691	2,221,301	4,439,859	5,163,738
Transportation for investment—Cr.	543,178	608,597	85,287	52,332	60,654	101,594	397,237	454,671
Railway operating expenses	266,640,598	248,317,688	114,363,091	106,926,514	43,917,053	41,494,902	108,360,454	99,896,272
Net revenue from railway operations	98,507,637	101,353,223	39,588,160	43,098,560	17,737,103	19,457,844	41,182,374	38,796,819
Railway tax accruals	*26,819,229	†27,944,754	12,639,500	12,177,252	5,499,499	5,488,179	8,680,230	10,279,323
Railway operating income	71,688,408	73,408,469	26,948,660	30,921,308	12,237,604	13,969,665	32,502,144	28,517,496
Equipment rents—Dr. balance	8,260,104	8,323,892	3,313,439	3,639,911	125,384	283,968	4,821,281	4,400,013
Joint facility rent—Dr. balance	2,870,728	3,362,231	1,615,755	1,849,692	351,002	470,986	903,971	1,041,553
Net railway operating income	60,557,576	61,722,346	22,019,466	25,431,705	11,761,218	13,214,711	26,776,892	23,075,930
Ratio of expenses to revenues (per cent)	73.02	71.01	74.29	71.27	71.23	68.08	72.46	72.03
Depreciation included in operating expenses	16,359,736	16,163,023	7,281,258	7,019,810	3,125,921	3,179,712	5,952,557	5,963,501
Total maintenance before depreciation	101,963,018	91,791,166	41,829,587	37,457,683	17,346,189	15,978,604	42,787,242	38,354,879
Net railway operating income before depreciation	76,917,312	77,885,369	29,300,724	32,451,515	14,887,139	16,394,423	32,729,449	29,039,431

FOR SEVEN MONTHS ENDED WITH JULY, 1937 AND 1936

Average number of miles operated	235,874	236,679	58,256	58,544	44,791	44,935	132,827	133,200
Revenues:								
Freight	$1,998,189,429	$1,809,282,582	$861,459,448	$781,834,629	$387,279,208	$357,912,829	$749,450,773	$669,535,124
Passenger	253,755,124	231,495,317	138,752,000	130,530,831	36,975,048	32,183,791	78,028,076	68,780,695
Mail	55,675,963	53,484,981	21,277,812	20,528,661	9,828,012	9,588,469	24,570,139	23,367,851
Express	34,946,977	32,129,779	14,121,742	12,602,452	7,650,220	7,140,689	13,175,015	12,386,638
All other transportation	51,651,798	47,941,768	26,790,673	25,259,198	5,293,635	4,755,915	19,567,490	17,926,655
Incidental	53,016,344	43,262,207	27,100,772	23,045,328	7,392,791	6,267,271	18,522,781	13,949,608
Joint facility—Cr.	6,988,603	6,313,783	2,146,237	1,907,551	1,479,249	1,429,841	3,363,117	2,976,391
Joint facility—Dr.	1,805,567	1,659,363	393,157	355,134	160,176	151,366	1,252,234	1,152,863
Railway operating revenues	2,452,418,671	2,222,251,054	1,091,255,527	995,353,516	455,737,987	419,127,439	905,425,157	807,770,099
Expenses:								
Maintenance of way and structures	289,866,706	259,097,286	113,580,409	99,743,928	50,840,681	46,713,930	125,445,616	112,639,428
Maintenance of equipment	491,408,178	446,035,642	224,882,698	201,490,126	87,663,387	81,312,784	178,862,093	163,232,732
Traffic	61,256,546	57,942,443	22,508,707	21,407,921	11,575,621	11,232,936	27,172,218	25,301,586
Transportation	872,471,997	797,126,174	394,331,806	367,157,303	143,269,910	132,172,719	334,870,281	297,796,152
Miscellaneous operations	23,473,726	19,955,466	10,458,456	9,097,467	3,124,141	2,553,282	9,891,129	8,304,717
General	89,752,925	91,591,779	38,364,275	40,308,406	15,985,048	15,538,050	35,403,602	35,745,323
Transportation for investment—Cr.	2,671,491	2,347,295	387,133	234,470	392,919	338,549	1,891,439	1,774,276
Railway operating expenses	1,825,558,587	1,669,401,495	803,739,218	738,970,681	312,065,869	289,185,152	709,753,500	641,245,662
Net revenue from railway operations	626,860,084	552,849,559	287,516,309	256,382,835	143,672,118	129,942,287	195,671,657	166,524,437
Railway tax accruals	‡192,942,393	§176,820,602	89,770,124	74,301,606	42,305,794	36,333,829	60,866,475	66,185,167
Railway operating income	433,917,691	376,028,957	197,746,185	182,081,229	101,366,324	93,608,458	134,805,182	100,339,270
Equipment rents—Dr. balance	54,885,858	53,636,112	23,515,418	25,047,644	3,767,824	3,105,226	27,602,616	25,483,242
Joint facility rent—Dr. balance	21,172,482	22,654,071	11,774,249	12,414,102	2,235,462	2,771,387	7,122,771	7,468,582
Net railway operating income	357,899,351	299,738,774	162,456,518	144,619,483	95,363,038	87,731,845	100,079,795	67,387,446
Ratio of expenses to revenues (per cent)	74.44	75.12	73.65	74.24	68.47	69.00	78.39	79.38
Depreciation included in operating expenses	113,870,110	112,930,862	50,473,230	49,138,755	21,868,731	22,324,519	41,528,149	41,467,588
Total maintenance before depreciation	667,404,774	592,202,066	287,989,877	252,095,299	116,635,337	105,702,195	262,779,560	234,404,572
Net railway operating income before depreciation	471,769,461	412,669,636	212,929,748	193,758,238	117,231,769	110,056,364	141,607,944	108,855,034

* Includes charges under the requirements of the Social Security Act of 1935 in the total amount of $3,340,997; also includes charges and credits resulting in a net credit of $1,280,021, because of provisions of the "Carriers Taxing Act of 1937", approved June 29, 1937, and repeal of the Act of August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress). The charges and credits were not handled in a uniform manner by all the carriers and separate totals are not available.

† Includes charges in the total amount of $5,307,846 itemized as follows: $1,504,618 for taxes under the requirements of the Social Security Act of 1935, and $3,803,228 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress.)

‡ Includes charges under the requirements of the Social Security Act of 1935 in the total amount of $22,620,351; also includes charges and credits resulting in a net charge of $10,602,591, because of provisions of the "Carriers Taxing Act of 1937", approved June 29, 1937, and repeal of the Act of August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress.) The charges and credits were not handled in a uniform manner by all the carriers and separate totals are not available.

§ Includes charges in the total amount of $29,488,895 itemized as follows: $10,091,842 for taxes under the requirements of the Social Security Act of 1935, and $19,397,053 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress.)

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.